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ABSTRACT

This report describes the views of a World Health Organization (WHO) expert committee on factors involved in bridging the gap between theory and practice in supplying primary nutrition health care. Following an introduction, the magnitude of the global malnutrition problem is outlined, and the responsibilities of workers in health and nutrition fields are discussed. Other topics addressed include: (1) past performance of health sector workers; (2) changing concepts of health and health services in political and sociological sectors; (3) objectives of the health sector in promoting nutrition at the local and national levels; (4) importance of collaboration among multilateral organizations, bilateral agencies, and nongovernmental institutions to raise the level of awareness about nutrition problems; and (5) importance of collaboration among nutrition programs. Essays are appended which deal with diagnosis, care, and prevention of malnutrition, administrative and manpower needs in the health care sector, and recent advances and research in nutrition. (FG)

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The role of the health sector in food and nutrition

Report of a
WHO Expert Committee

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WHO EXPERT COMMITTEE ON THE ROLE OF THE HEALTH SECTOR IN FOOD AND NUTRITION

Geneva, 23 September to 1 October 1980

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THE ROLE OF THE HEALTH SECTOR IN FOOD AND NUTRITION

Report of a WHO Expert Committee

1. INTRODUCTION

A WHO Expert Committee on the Role of the Health Sector in Food and Nutrition met in Geneva from 23 September to 1 October 1980. The meeting was opened on behalf of the Director-General by Dr D. Tejada-de-Rivero, Assistant Director-General, who emphasized that the field of nutrition exemplified better than any other the inequalities existing in our world today—such as the gaps between the "haves" and the "have-nots" and the desperate situation of those "have-nots" at the present time. It was an unacceptable fact that in the world today millions of children were dying from hunger and malnutrition while other population groups, as a result of overeating, were suffering from obesity and associated illnesses which are a major health problem.

Dr Tejada-de-Rivero stressed that a rational way of providing nutrition services to the people who need them most was now open through the primary health care approach which WHO's Member States had accepted. One important responsibility of the health sector therefore was to decide on the range of nutrition activities to be incorporated in the integrated primary health care package, how those activities should be organized and delivered, and what type of manpower resources would be needed in the existing country situations. There were, however, many constraints to the implementation of primary health care and their recognition and understanding were the first step in bridging the gap between conceptualization and practice.

One of those constraints was the fragmentation of health services operating on the basis of independent and isolated activities directed at dispersed targets (specific age groups or specific diseases), or activities based on a specific technology for disease control. Moreover, the health services had been conceived and developed from the point of view of the providers of health care, without the participation of the people to be served. In the comprehensive and systematic primary health care approach to health services, however, all pos-

sible health activities were closely interrelated, priorities among the different components were defined in relation to the needs of the population, and supportive and complementary actions from other sectors were considered.

In spite of genuine and honest acceptance of the concept of primary health care, health workers remained within their specific technical areas of responsibility while some health specialists might try to "adapt" their own specialized field within the framework of primary health care. This aggregation of independent activities, even though considerably different from the traditional lines and "adapted" to the primary health care concept, was a poor substitute for fully integrated health activities that corresponded to the needs of the people and the resources available at national or community levels. Policy-makers, technical specialists, health administrators and funding institutions often demanded "minimum packages" of primary health care activities. The idea of an initial minimum package as a universal model, however, was incompatible with the wide range of situations between countries, within countries, and especially between communities. It should be realized that these differences were the very factors that should determine the components to be included in individual community packages, so that a universal model was not possible.

The main challenge at present was how to bridge the gap between theory and practice—in other words, how to translate the necessarily theoretical aspects of the solution of a problem into concrete, practical and feasible actions. What was needed by WHO—and the countries it represented collectively—were scientific solutions that were feasible in their implementation so that the worldwide food and nutrition problems could be dealt with by the health and other sectors concerned.

2. THE MAGNITUDE OF THE PROBLEM

There is at present no agreed way to obtain reliable estimates on the extent of malnutrition in the world. This is partly due to the different types of malnutrition that coexist (undernutrition, overnutrition, and the specific deficiency diseases), partly due to the inherent difficulty in defining when biological adaptation might be considered to be pathological, and partly due to the variety of measurements that are used and interpreted according to different criteria. However,

in any attempt to measure the magnitude of the problem, one must distinguish between overt cases of malnutrition (requiring urgent correction) and the more insidious conditions (where the malnutrition has less acutely drastic consequences). It is important to emphasize that, with very few exceptions, nutritional emergencies arise from, or are superimposed upon, pre-existing conditions of chronic malnutrition. Famines occur where the food supply is already precarious. It follows that preventing nutritional emergencies or helping communities to rehabilitate themselves after such an emergency requires long-term and coherent measures.

Despite these difficulties it has been estimated that, in the world as a whole, around 100 million infants and small children are moderately or severely underweight (i.e., below 75% of the reference weight for age). Of these, 10% (or about 10 million) are below 60% of the reference weight, which implies an acutely life-threatening situation for these infants and toddlers (*1*). The Food and Agriculture Organization of the United Nations (*2*) and the World Bank (*3*), using different criteria, have estimated that there are some 400 to 500 million people in the world whose diet is deficient in energy.

There is little information on recent worldwide trends; the evidence, however, suggests that, while the proportion of the population that is undernourished has probably decreased over the past two decades, the total number is growing.

2.1 Food supply

One of the major factors determining nutritional status is the nature and extent of the food supply. If there is an inadequate food supply, malnutrition can be expected. However, the converse is not necessarily true. An abundant food supply does not ensure good nutrition; factors that affect food availability (and the demand for it) will influence food consumption patterns; similarly, the biological utilization of food is affected by various physiological and disease states.

Considering all these factors, there is probably enough food produced globally to satisfy the nutrient needs of the world's population. The situation varies in different countries of the world; in the decade of the 1960s there was an increase in the number of countries where national food availability exceeded the estimated recommended energy and nutrient allowances (*2*). This trend seems to have continued during the 1970s.

The distribution of food within a country can also vary and is never perfectly equitable, the poor and underserved usually being worse off nutritionally. Within a family the distribution of food may fail to meet the physiological requirements of some of its members, particularly the mother and preschool-age children.

2.2 Food demand

As the twentieth century advances, an increasing proportion of families in the world are influenced by rapidly changing economic factors and life-style; this applies particularly to urban populations, but even among rural populations the reliance on bought foods is also increasing. Consequently family incomes and the prices of basic commodities (including food) are becoming increasingly important influences on national nutritional status. Increases in food supply that are not accompanied by a greater effective demand (i.e., economic capability to obtain the food required) of the consumers who are most in need cannot be expected to show improvements in nutritional status. An example is the "green revolution", which, despite gains in production, did not by itself result automatically in a decline in the prevalence of undernutrition.

The availability to individuals of an adequate and secure supply of food is, of course, not solely dependent on supply and incomes relative to prices. There is a complex web of influences on food consumption acting internationally and nationally in communities and within the family. These influences fall within the purview of such disciplines as economics, agronomics, sociology, communications, home economics and political science. Thus the increasing economic disparities between nations, the unreasonable distribution of incomes and other resources within some nations, and the poor distribution of food within many families all contribute to the failure to eradicate or prevent malnutrition in the world.

2.3 The health sector

The health consequences of malnutrition go beyond the specific nutritional diseases themselves. Undernutrition lowers the productivity of workers, impairs the psychomotor development of infants and young children, and increases the susceptibility of individuals to infectious diseases. Overnutrition, as indicated by obesity, increases

the risk of developing diabetes mellitus, hypertension and cardiovascular disease. Nutritional imbalance is therefore a contributory or a causative factor in a wide range of illnesses.

The health consequences of undernutrition are particularly severe in infants and young children. The Inter-American Study of Patterns of Childhood Mortality (*4*) indicated that nutritional deficiency was the most serious health problem (as measured by its involvement in mortality) uncovered in the investigation; in fact, 57% of the children who died under 5 years of age were found to have had immaturity or nutritional deficiency as either the underlying or an associated cause of death. In many countries this underlying cause is frequently not mentioned in death certificates; consequently the importance of undernutrition as a cause of infant and young child mortality is often not realized.

Women are also particularly vulnerable to the effects of undernutrition. Repeated, closely spaced pregnancies can result in a depletion of nutrient reserves in the mother. The demands of menstruation also, if the diet is inadequate, can result in anaemia. In turn, undernutrition of a pregnant woman can result in a low-birthweight infant with a consequent greater risk of morbidity or death.

In summary, malnutrition itself can lead to illness or death, but more commonly it results in generalized functional impairment and a reduced ability to withstand the assaults of infectious organisms. These consequences of malnutrition are of direct concern to the health services, but are also important inhibitors of economic and social development.

Both the international and the national health sectors have a particular responsibility to maintain up-to-date and reasonably accurate surveillance of the nature and extent of malnutrition and of trends in related conditions. They must be able to recognize sudden changes in nutritional status that occur in the regions of the world, in countries, or in various ecological zones within a region or country. The causes of malnutrition are multiple and arise beyond the health sector's boundaries. The results of malnutrition, while they also extend beyond these boundaries, are most directly measurable through health indicators. Because of its multiple causation, malnutrition is often considered as everybody's concern but nobody's responsibility. The health sector has a particular responsibility in the promotion of good nutrition, the prevention and treatment of malnutrition, and in the rehabilitation of malnourished subjects; it also has to play a role in stimulating and cooperating with relevant programmes in other sectors.

A Joint FAO/UNICEF/WHO Expert Committee on Methodology of Nutritional Surveillance (5) recommended a series of health and dietary indicators of nutritional status. These provide the health authorities in each country with a useful guide from which they can select those indicators that are suitable for the country's own needs and are consonant with its resources. At the same time it is important to have uniformity of indicators so that a global nutritional status surveillance system can be maintained. Such a system should be integrated into a global system of surveillance of food production, food availability and food consumption. WHO should lead the international community in agreeing upon a set of indicators with which to assess the magnitude of the problem globally.

Knowledge of the nutritional status of a population does not, by itself, reveal the causes of impairment or necessarily enable rational measures to be taken. Surveillance of food supply and demand is the responsibility of sectors other than the health sector. Similarly a food and nutrition strategy that is designed to optimize the nutritional status of a population will contain an integrated set of programmes involving many sectors. The health sector, therefore, has a responsibility to draw the attention of other sectors to the existing state of nutrition and to maintain their awareness of changes that may be occurring, to collaborate in programmes intended to alleviate nutritional problems, and to play a leadership role in its own specific programmes. Thus, the health sector has a responsibility to keep *itself* informed of the nutritional situation and of the progress of nutrition-related programmes so as to improve its own effectiveness.

3. PAST PERFORMANCE OF THE HEALTH SECTOR

The health sector has been very successful in devising means of diagnosing and treating protein-energy malnutrition. It has also had considerable success in preventing some specific deficiency diseases. While the treatment of anaemias has improved a great deal, prevention has been less successful. Recently in many countries, the health sector has become concerned with the problem of obesity and the dietary prevention and management of obesity-related diseases.

There has been far less success within the health sector in defining the extent and functional consequences of the problem of malnutrition and in devising methods for the promotion of good nutrition and prevention of protein-energy malnutrition. This is partly because, in

the past, an oversimplified view of the causes led to narrow ideas for intervention and a failure to approach the problems of malnutrition in a truly intersectoral way; and partly because of an overemphasis on elaborate intervention technology without a commensurate development of methodologies, and a failure to integrate surveillance, promotion and prevention into functional systems. Cost-effectiveness analysis has also been weak and health scientists have had a tendency in the past to develop techniques which, though effective, were too costly in terms of the available financial, social, logistic and human resources.

As the greater complexity of nutrition problems began to be recognized, intervention strategies have been extended to include other areas such as social and economic policy, as well as to introduce new skills such as planning and management which are applicable to the entire range of intervention activities. In the evolution of these strategies, there was first the realization of the need for *intersectoral collaboration* in nutrition intervention programmes to deal with this matter, high-level coordinating bodies with a secretariat to help implement the decisions were established. Then it was realized that political will was needed in order to energize the coordinating body or secretariat. This, in turn, led to the realization that the political will had to include not only the will of the political decision-makers, but also that of the technocrats who had to agree on the priorities of the nutrition problem and provide the necessary impetus, and the will of the people to work for a better standard for their own community.

These developments point to a more intensified role of the community in solving its own problems. Thus, the concept of *community involvement* has emerged as the most important key to success in nutrition programmes and health programmes. This is, in fact, the basis for the concept of primary health care as a strategy for health for all.

Community involvement is related to many important aspects of strategy development. First and foremost is the need to strengthen the capability of the people themselves in identifying their own problems. This has been realized in other aspects of primary health care work but not so much in the area of nutrition. It is essential that the health specialists and the people should work together to realize a common goal, and not for the health specialists to do the work for the people. It is also equally important that the people should not work for the health specialists.

Secondly, community involvement also calls for upgrading the capability of the people in planning and management, and in the utilization of nutrition information. This may be one of the areas which the health sector previously failed to promote. Nevertheless, this sector has made considerable progress in recent years in acquiring and applying health planning and management skills. The need now is to ensure that this capability is extended to the periphery, in order to include village-level planning and management of development programmes. There have nevertheless been specific instances where planning and management by the people had been supported and strengthened, and in which the action programmes carried out by them could be maintained with minimum support from outside. This was especially the case when certain income-generating components were included as an integral part of service provision. This illustrates once more the importance of the relationship between planning, management capability, and the creation of an economic base in the development of nutrition programmes.

Because of the absence of community involvement and community-based programmes in the past, there was also a deficiency in the identification and mobilization of community resources. As has been stated before, work with the community in the past rarely involved the people themselves. Even today, nutritionists still tend to take problem identification into their own hands, with little emphasis on the involvement of the people so that this role could eventually be transferred to them.

If nutrition intervention programmes are to be reoriented to become something created by the people and run by the people for the people, another important consideration will emerge—namely, that technology must be simplified and made easily transferable as well as appropriate to the needs and resources of the people who use it. This adaptation of technology is hardly possible without the reorientation of *applied research* programmes in nutrition. Even at the present time, much more effort needs to be invested in this field. If nutritionists could impart to the people only a half or even a quarter of the existing knowledge gained from previous experience, the nutrition situation would improve considerably.

The traditional orientation of research programmes may be considered a result of past strategies of manpower development, which placed emphasis on specialized training and the characterization of nutrition as a separate subject. Today, with the realization of the importance of nutrition intervention as a multisectoral endeavour,

there is a shift towards multidisciplinary training of workers from different sectors, who are taught the basic and applied side of nutrition as well as the social and economic sciences, so that they are well prepared to support the community in the development of their nutrition programmes.

At the community level, again, *human resource development* assumes major importance and needs careful strategy formulation. For nutrition intervention to have a long-lasting effect, it must remain with the people themselves to carry it through. Here, the development of human potential from the villages needs to be a long-term strategy. One important characteristic of development at this level is that it has to be multidisciplinary. People will be convinced of the usefulness of nutrition programmes only if they are dissatisfied with their nutritional state, which often becomes obvious to them too late because of neglect. Hence, the necessity for integrating nutrition activities with other development programmes if this problem is to be attacked at an earlier stage.

It is now evident that improvements in the performance of the health sector will not only appear as a result of more specialized knowledge about specific nutritional disorders or of more specialized interventions and technology, but they will also arise from a broadening of concepts in respect of the complex nature and ramifications of nutrition problems, from the acquisition and application of administrative skills such as planning and management, and from the involvement of other specialists in the development of sufficient manpower resources. Improvement will be contingent on the recognition of many basic principles in the primary health care strategy, including the importance of full coverage, the involvement of the community, the development of appropriate technology, and the diversification of manpower resources.

4. CHANGING CONCEPTS OF HEALTH AND HEALTH SERVICES: NEW OPPORTUNITIES FOR NUTRITION PROMOTION

4.1 Changing concepts of health

Health is now considered to be an end for each human being and a means for the society to which he belongs. It is an end because it reflects homoeostasis, the normal physiologically coordinated functioning of body and mind, which is a mechanism for producing a relatively

stable condition within a range of adaptations to internal and external stimuli. The relation between nutritional requirements and homoeostatic mechanisms is of significance because beyond a certain level of undernutrition, the compensatory mechanisms cannot prevent impairment from resulting. The establishment of this level involves a complex process. In addition to being an end for each person, health is also considered to be a means for society, because it is through the collective efforts of people that productivity, economic growth, and wellbeing are fostered; thus development occurs. Although man is the means for development, he is at the same time its end and purpose.

These ideas are reflected in the definition of health in the WHO Constitution, which states: "Health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity." This definition is idealistic for it is subjective and refers to a situation that may exist in some individuals at a certain time, but not in everyone all the time; it is not usually observed in groups of human beings and in communities. Furthermore, health is considered a continuous, dynamic and multicausal process, subject therefore to constant subtle variations, and not a state implying a static condition. This process is halted only by the onset of diseases of varying etiology, reflecting the failure to adapt to the inner and outer environments. However idealistic the definition may be, it symbolizes the aspirations of people and represents an overall objective of societies and their governments.

A major and constant problem is how to translate this ideal into practical reality, particularly when it is known that human aspirations have never been and will not remain the same. In planning health care, one must consider all the people all the time. As a result of decolonization, industrialization and urbanization during the present century, people's expectations (in matters of health also) have changed. In an increasing number of societies, health care is no longer accepted as an item for charity or as the privilege of the few, but is demanded as a right for all—equal rights to the available health care services for everybody—a goal that has still to be reached in many developing countries.

The recognition of health as a right has also been strengthened by the acceptance of its role as a determinant of development. Modern economic theory does not accept that social programmes—health and nutrition included—can only result from a reinvestment of savings. It is now postulated that health care programmes can also be evaluated in terms of improved production, investment and consumption in the

population concerned (9). On the basis of the same reasoning, health care programmes should facilitate the exploitation of natural resources and contribute to a better environment. The concept of human capital has also been reintroduced to explain the differences between total national input and estimated output as reflected in economic growth. The investment multiplier effect of specific programmes can be significant.

The debate of the last two decades has contributed significantly to the shaping of lending policies of international banks and capital-exporting governments. Programmes having health and nutrition objectives can be regarded as investments in their own right because they reduce mortality and morbidity, and improve life expectancy, wellbeing and productivity. However, in situations of high unemployment, the feasibility of motivating political leaders on the basis that better nutrition brings greater productivity has been questioned. The main argument is that it is simpler to have recourse to the idle labour force than to invest in improving the nutritional status of workers. This way of thinking reflects a static view of the economy as one that will make no progress and therefore may not need more and diversified producers and consumers. Furthermore, it should be realized that training (for any skill or profession) takes time, and society should not delay this process until it is in need of a healthier and more effective labour force.

Conceptually, at present, the health of individuals and whole societies is considered to be the result of interactions of heredity, environment, behaviour, and health service interventions. It is an ecological interpretation reflecting the innate and acquired adaptive capacity of each person to a changing inner and outer milieu. The concept of etiology, of the specific cause, has been replaced by the "web of causation" and the "web of effects", both reflecting the complexities of an anthropocentric natural system. While multiple causes may bring about multiple effects, at the same time a single effect may result from multiple causes. Relationships like these may well justify the need for synergistic programmes to improve health and nutrition.

With progress in such conceptualization it has become possible to differentiate in the environment the animate, inanimate, and behavioural determinants of health and disease. All of them interact with human beings. Great advances have been made regarding the first two determinants but progress has been limited with the third, which is the province of the sociocultural sciences.

4.2 Changing concepts and practices of health care services

A great imbalance between supply and demand of health care services is evident throughout the developing world. It varies within a country and between countries. The health care system, including both private and public institutions, has limited coverage and the poorest strata in society have very limited access, or none at all, to any service. Moreover, economic and social development programmes simply do not reach them. As a result, the demand for health care is not satisfied for a number of people either because local resources are lacking, or because the services are inaccessible, understaffed or not accepted by the community. There is also a cultural constraint imposed by the beliefs, superstitions, and traditions of the villagers regarding the meaning of health and life. As a result, the supply of services is sometimes not followed by the demand for them.

Health care programmes are mainly implemented in the capital and more populated cities of each country, showing an uneven placement that is not equitable in relation to the health needs of the people.

This misallocation of physical resources for health care is related to a very uneven distribution of human resources. University graduates and technical and auxiliary personnel are concentrated in the large cities in services and teaching, and are not always devoting their efforts to the more prevailing problems. Besides this irregular distribution, there is also a functional misallocation resulting from the formal educational process of physicians, whose training has been stigmatized as being disease-oriented and not health-oriented; as a consequence, emphasis is placed on treatment and not on prevention, on individual care rather than community care. Furthermore, health problems with a high incidence of cases are not always analysed in depth and with an ecological approach that covers all the biological and socioeconomic determinants and consequences as a basis for remedial actions. Malnutrition is a particular case in point.

Although the importance of medical care is recognized, it has been relied on too much for attempts to improve the trends of morbidity and mortality in traditional and transitional societies. Diseases in these places are to a large extent environmental in origin, and are preventable by increasing the resistance of individuals and reducing the deleterious effects of disease agents operating in their surroundings. There is consensus now that much larger health benefits for infants and children could be obtained with a well-balanced diet, better

sanitary conditions, and a stimulating environment than with ultra-modern hospitals. Wherever the latter may be needed—and sometimes there are sustained pressures from the community to have them—functional efficiency, not excessive splendour, should be the guiding principle.

Seldom have hospitals as institutions gone out of their way to reach the community; this is mainly due to the paternalistic attitude of the professional staff, who have not identified themselves with the community they serve. There is a need for changing from a clinical approach to the community approach, so that these institutions will not just provide services but will also educate families to take care of themselves, particularly concerning their nutrition.

Health care was conceived and has remained as a service to be provided or, in the case of preventive measures, to be imposed (with the best of intentions) by the central authorities on the people. The present is, however, a period of change from paternalism to community participation. There is evidence in several countries that the people now want to cooperate in helping their government to make its decisions and to implement them. What is essential is first to listen to the people concerning the problems which they consider are most pressing and to the solutions they propose, then to make joint decisions, and finally to assign responsibility to community members for specific actions to be performed (including, wherever possible, financing). On their side, the people have the right to services that are accessible, effective and efficient. Community participation has become an aphorism that is, however, still awaiting genuine realization in many countries of the world. No standard pattern can be recommended since there is a wide range of economic and social problems, as well as political and cultural traits, among and within these countries. For the same reason, priorities and actions to prevent and cure common diseases may differ greatly in accordance with the characteristics of each community. What is essential is flexibility of approach. Because the people are certainly acquainted with the social ills affecting them, village resources and not health care alone must be used to implement the nutrition strategies. In practice, community participation (from the stage of planning to evaluation) may be considered as a decentralization of decision-making, or even a delegation of authority to the people. However, the government and professional staff play an essential role in providing the specialized knowledge for actions selected by the community and in catalysing the vast potential of community effort for the attainment of health and social objectives.

And yet, primary health care is fraught with problems. The demystification of health has brought opposition from the professionals whose attitudes must be taken into account in order to enlist their essential collaboration for reaching the objectives of jointly agreed programmes.

4.3 The renaissance of primary health care

Statements have been made in the past by governments on the significance of increasing the coverage of the health system to reach the periphery. In addition, a series of circumstances have led to the primary health care movement in the world, with the theme "Health for all by the year 2000" as a symbol that expresses the determination of the countries to provide an acceptable level of health to all people "as an integral part of social development in the spirit of social justice". The links between primary health care and social development are close and they have been discussed extensively in recent years, especially at the Alma-Ata Conference in 1978 (*6*). Briefly some selected aspects, which have a bearing on nutrition promotion, are described below.

More and more evidence shows that higher risks of death, hunger, disease and disability are concentrated among the poor, and that the various development programmes are not reaching them. In the health field, *adequate services* are lacking for a large proportion of the population, particularly those living under conditions of critical poverty, who may only have recourse to some form of empirical medicine from indigenous health workers. Although the latter are useful, their work would be rendered more effective if they were given adequate training and supervision.

The active worldwide debate concerning the impact of population growth on family wellbeing confirms that high levels of fertility usually accompany poor health and social conditions. In recent years the *family planning* movement has been extended to many countries, but much has still to be done so that couples will be able to decide on the number and timing of births, with the aid of services provided by the government. Such programmes must be a component of effective health care planning and implementation.

Deficiencies in the organization and administration of national and local health institutions are among the major obstacles for providing the means for the prevention and treatment of disease. With the

same investments as at present, a significantly greater return in health care could be obtained. Therefore the need for *budgetary reform*, particularly in support of the multidisciplinary approach, is evident; however, more extensive coverage will become feasible only with larger health budgets.

Although there is sufficient knowledge, carefully tested, concerning health care that warrants extensive application, there are substantial unknowns that warrant further experimentation so that rational decisions may be based on facts. Even more significant is the fact that dissemination of scientific knowledge has led to imitation and adoption of methods and technologies for problems that have usually little or no priority in developing nations. They may be useful for the few, but not for the many. The need for *appropriate technology* has thus become essential. Such technology must take into account the local value systems and existing resources to ensure continuity of use; it should also be accepted by the community. And yet, pertinent research lags behind.

Should primary health care become the central focus in a society, the whole health care system will have to be reorganized accordingly. Nevertheless, to emphasize exclusively the social periphery—people in rural areas and shanty towns—is to forget that a rational health system must include primary, secondary, and tertiary care, three interdependent phases of increasing technical complexity in one process. To achieve this is more easily said than done, particularly where geography, climate, economic infrastructure, funds, the effectiveness of each subsequent level, and other factors are the main constraints to an adequate referral model of health care delivery. Still, it must be attempted; the alternative is to perpetuate categories of care according to location and income, whereby the disadvantaged will get, perhaps forever, only primary services which may not always be adequate, sufficient and efficient. As a matter of principle, preventive services without curative ones are as unbalanced as curative services without prevention.

It is now evident that technical knowledge is of little use without political will. Yet, the latter, and its resultant decision-making process, are not the privilege of only certain political structures, as the history of public health shows. Despite evident constraints, the primary health care movement must be developed because experiences from the past, as well as recent successes, amply justify its feasibility and the promises of the contribution it will make to equity and social wellbeing. Since the primary health care system entails basically a

health concept and a development strategy, it should—if properly organized—help to reduce disease and increase productivity. It may well be the much-needed stimulus for rural development.

4.4 How the concept of nutrition has changed

Through the centuries, food has been recognized empirically as important for human beings in health and disease. The history of man has been, to a large extent, a struggle to obtain food. During the eighteenth and nineteenth centuries, research was concentrated on the study of the chemical nature of foods. In the present century, micronutrients were discovered and specific nutritional deficiencies were identified and technologies developed to control them. Many of these discoveries, however, have not yet been applied in countries where deficiency diseases are prevalent.

In the last 30 years, nutrition has been recognized again as a cause of social problems—as a result of publicized outbreaks of famine and the tragic visage of severe malnutrition and chronic hunger, the recognition of the right of every human being to a balanced diet, the role of nutrients as supporters of health and (when lacking) as inducers of disease, and the higher incidence of nutritional deficiencies (and accompanying impairments of physical growth and intellectual development) and death rates among those living in critical poverty.

It has been said that the concept of nutrition is vague, imprecise, and difficult to bring into focus because it has a bearing not just on any one sector of development, but on many of them. Moreover, priority is given in national budgets to food (understood as production) rather than to nutrition (in the sense of food consumption). This type of thinking, which has prevailed for a long time in the developing world, accounts for the scant attention given in general development and sectoral policies to the adverse effects of poor nutrition. It explains why nutrition appears to be everybody's concern and nobody's responsibility. The need for clearly defining the series of measures that would bring about an immediate improvement in the nutritional status of the people (particularly those exposed to a high risk), as distinct from other health activities, is therefore now urgent.

In order to understand the dynamics of malnutrition, it is essential to examine the causes as well as to look at the symptoms. The former, rooted as they are in privation, are a reflection of the prevailing

political systems and the decisions that lie behind economic and social strategies, including those for agriculture, health, population, and education. The control and prevention of malnutrition should take into account, simultaneously or successively, the processes and resources that relate, at the macro-level, to the production and availability of food and, at the micro-level, to its consumption and utilization. It is the government that bears the fundamental responsibility, from diagnosing the problem and assessing its scope to executing the programmes using whatever approach is selected. In this context, differences of opinion may arise among those who interpret the current trends and predict the future situation of chronic undernutrition in a given country or region and who suggest approaches for a progressive solution. There is agreement, nevertheless, that there are no panaceas.

Experience has shown that neither increase in employment and family income, nor sustained agricultural production will by themselves improve diets and reduce chronic undernutrition and its attendant mortality, morbidity, and poor work performance within a reasonable period of time. In some countries it may take one or more generations. Reutlinger & Selowsky (3) have come to the conclusion that "malnutrition is unlikely to disappear in the normal course of development: that is, in the course of normal per capita income growth, even with greater emphasis on expansion of food production—barring, of course, unusual technological breakthroughs. On the contrary, the situation may worsen if the present higher energy cost, leading to higher cost of food production, is not fully compensated by higher agricultural productivity."

At present, the coverage of programmes in the social sectors—health, education, population, food subsidies, housing—is neither sufficient nor efficient. The supply of services falls short of the demonstrated demand. Scarce resources are not being assigned to the most widely prevalent problems, nor are they benefiting those who are most greatly in need. Seldom is there an integrated approach to combat the synergism of social ills. However, there is consensus that the pace of development (in terms of employment, higher income and sustained agricultural production) must be accelerated. At the same time, many countries need to institute profound changes in policies, objectives, structures, investments and technologies for guaranteeing an adequate intake and biological utilization of food for all the people. While these changes are occurring, as they should, direct and indirect nutrition programmes remain the best available

means for reducing the rate of malnutrition and its consequences in the short run.

Thus the health care sector has a significant role to play in the field of nutrition. Past history shows that, despite the needed and long-overdue changes, so little was done that the problem remains, or is worsening, in some poverty-stricken countries of the world. Nutrition objectives are either absent or have a low priority in the health system, and no well-tested methodology is available to introduce them in primary health care for a large population. The role of community leaders, which is of paramount importance for the effective implementation of programmes, is not clearly defined. As a general rule, nutrition considerations are not usually included in development policies, and agricultural production is not consistently guided towards the improvement of the people's nutritional status. Cash crops frequently take precedence over food crops, and imports are not enough to satisfy everybody's consumption needs. "Low-income populations are well schooled in the science of survival", write Austin et al. (7), "and many traditional food mixtures and processing techniques have served them fairly well... Planners whould be well advised to begin with the traditional foods that fit the social context, calling upon their armamentarium of technology only to improve what already exists". However, through a true process of mass adaptation, communities make do with the available sources of energy and nutrients by less efficient work performance and lower productivity.

Recent advances have led to a better understanding of the food and nutrition planning process in terms of concepts, purposes, methodologies, and limitations. As in the case of planning in the health field (and in other sectors of social development), nutrition planning is a mechanism for reaching specific objectives by means of defined actions that will reduce the numbers of severely malnourished persons and those at great risk of becoming malnourished.

In sum, there has been in recent years a better understanding—based on sound experience—of the extended roles of health care to improve the nutritional status of the people and to reduce the incidence and consequences of malnutrition in the context of a rational food and nutrition policy. The present need for redefining the responsibilities of the health sector and redirecting its efforts is therefore amply justified.

5. ROLE OF THE HEALTH SECTOR IN NUTRITION

5.1 Introduction

As the major communicable diseases, especially in the developing world, are gradually controlled, malnutrition is, and is likely to be for some time, the most important factor influencing the quality of human life in most developing countries. Malnutrition is not only a major health problem, but also a serious impediment to national socio-economic development.

The underlying causes of malnutrition are varied. They involve such variables as food production and related agricultural policies, food distribution systems, income possibilities for the rural and urban poor, general education, feeding habits and child-rearing practices, availability and use of health services, environmental sanitation, an adequate supply of safe water, and many other related factors. None of these can be neglected; they interact in highly significant ways. The need for a coordinated multisectoral food and nutrition strategy stems from this fact.

The health sector has an important role within this multisectoral framework. It provides services for general health care as well as specific interventions for nutrition promotion. Even in the absence of specific nutrition interventions, general health measures can have an appreciable impact on nutritional status. Improved sanitation and provision of safe drinking-water can significantly reduce the incidence of gastrointestinal infections and parasitic infestations. Malaria eradication is another example of health sector intervention with considerable impact on nutritional status. Immunization programmes can control the infectious diseases of childhood. The duration and severity of respiratory and gastroenteric infections can be reduced. Improved child-spacing can also be encouraged. These would all be tremendous achievements which would be reflected in morbidity and mortality statistics and in the reduction of the severe forms of malnutrition. In addition, mothers can be encouraged to adopt good child-feeding practices within the limits of their ability to follow them in the face of practical problems of hygiene, food preparation, feeding routines and the availability of recommended foods.

Most developing countries, realizing the gravity of malnutrition problems, have adopted various types of intervention (addressed directly to these problems—through the health sector) which differ

considerably from one country to another. However, there is evidence to indicate that their impact has been disappointing. Two important factors have contributed to the relative lack of success in the implementation of programmes for malnutrition prevention and nutrition promotion. They are:

(1) Inadequate coverage of the population by health care services, the groups in greatest need having the poorest services, if any at all. Nutrition measures, through the health sector, therefore hardly reach this segment.

(2) Adoption of nutrition interventions which were either inappropriate or unadaptable to the local conditions.

The importance of rationalizing the role of the health sector in nutrition promotion is being increasingly emphasized. During the last ten years, the commonly accepted measures for nutrition promotion and malnutrition prevention, which are commonly implemented by the health sector, have been critically analysed. It is considered that, even in the prevailing socioeconomic situation in most developing countries, if the nutrition interventions are properly conceived and implemented, they should have a definite impact on the nutrition and health status of a large segment of the population.

Recently, the primary health care approach has opened up new possibilities of enlarging and strengthening the nutritional impact of the health sector's measures. It has the potential of overcoming both the adverse factors mentioned above—inadequate coverage and inappropriate approach. The role of the health sector in nutrition clearly needs redefinition.

More than any other sector, it is the health sector that receives directly the impact of malnutrition. Thus, an important reason why the health sector should take a definite and special responsibility in the implementation of nutrition activities and programmes is the unfavourable effect of malnutrition on health standards. This situation is due in part to the direct effects of malnutrition, but mainly to the synergistic interaction of malnutrition and infection. The end result of this nutrition-related syndrome of ill-health is clearly shown by:

(*a*) increased morbidity and mortality rates, mainly in children under 5 years of age;

(*b*) failure to reduce those rates, to accomplish the health objectives, and to reach the planned goals in health programmes, particularly in maternal and child health (MCH) projects;

(*c*) insufficiency of health services and personnel owing to an increased demand for health care;

(*d*) increased costs of health programmes and services, which represent the main obstacle for the expansion of health services and population coverage in developing countries.

It should, however, be recognized that the health services alone cannot solve nutrition-related health problems when the causes are fundamentally rooted in the state of the society. All the health-service-induced benefits mentioned earlier will not eliminate the basic causes of malnutrition among the populations who live below the poverty line. In these circumstances, the problem is to try to make these people more productive. This needs a range of policies and programmes within the framework of the national development plan; in other words, a comprehensive multisectoral food and nutrition strategy. The limitations of a health sector's strategy, even through a successful primary health care approach, should be borne in mind.

5.2 Types of responsibilities of the health sector

It is widely recognized that malnutrition is a social disease having multiple causes lying in different developmental sectors. Being a multisectoral problem, malnutrition needs a comprehensive coordinated food and nutrition strategy within the framework of a national socioeconomic development plan. The health sector, or any other sector alone, would not be able to make any effective impact on the nutritional status of the population. However, the health sector is in a unique position, because of its capability and direct contact with the problem, to make important contributions to the prevention and control of malnutrition. In general terms, the responsibility of the health sector includes cooperation in the process of planning and implementation of the multisectoral strategy at the national level, the provision of preventive and curative services to the population at the community level, and participation in the monitoring and evaluation of nutrition plans and programmes.

In order to have a sound basis for planning and implementing a multisectoral nutrition programme in a country, the following conditions have to be fulfilled:

(1) A complete knowledge is required of the nature, magnitude, geographical distribution and final effects of the prevalent nutrition problems in different population groups. This will aid the definition of both target groups and priority target areas.

(2) A knowledge of the main causative factors and environmental circumstances responsible for nutrition problems is required. It is

important to underline that there are food-related and non-food-related determinant factors of malnutrition. This knowledge will allow the identification of specific strategies to control each of the nutrition problems, through both preventive and curative interventions.

(3) An analysis of the existing resources and constraints is required in order to place the nutrition programme on a realistic basis.

(4) The information on the magnitude, causes and effects of nutrition problems should be stated clearly and made available to the public, and particularly to the policy-making groups and politicians, in order to promote the establishment of a sound food and nutrition policy and to motivate the allocation of sufficient funds for the implementation of nutrition plans and programmes. It should also be made available to sectoral planners, with special emphasis on their respective sector-related causes, effects and possible responsibilities for solving the problem. This will motivate the introduction of nutrition-oriented sectoral interventions and will facilitate the multisectoral coordination of programmes.

The health sector has a major responsibility in the fulfilment of the above conditions that are concerned with the description and analysis of nutrition problems, which will guide the establishment of specific strategies, and with the motivation and cooperation of national and sectoral planners as well as high-level policy-making groups. In addition to its contribution to the planning of national strategies, the health sector has direct responsibility for the prevention and control of malnutrition and other deficiency diseases—namely, all the preventive and curative interventions implemented at community level by members of the health team in local service units throughout the health infrastructure of the country.

Even when practical measures cannot be found to reduce or eliminate the basic causes of malnutrition, the health sector can provide the means of improving the nutritional status of the population or alleviating the consequences of malnutrition. An understanding of the different variables producing malnutrition and ill-health will indicate the nature and type of the action to be taken.

Curative interventions are usually aimed at nutritional deficiencies in the clinical stage and are undertaken by the health services responsible for general medical care of the population. Severe forms of protein-energy malnutrition such as kwashiorkor and marasmus in infants and young children are by far the most important conditions calling for curative services. In the overall context of health services, curative services deal not only with the direct consequences of dietary

inadequacies in the form of nutritional disease, but also with synergistic combinations of malnutrition and infection resulting in a malnutrition/disease syndrome of which the most frequent examples are diarrhoea, infections of the upper respiratory tract, and several viral infections (see Annex 3).

There is also a wide range of measures of primary prevention of malnutrition which fall under the health sector's responsibility (see Annex 2). They include educational activities for improving dietary practices, food fortification, supply of safe drinking-water, family planning, and specific protection measures such as immunization against infectious diseases of childhood and supplementary feeding programmes for vulnerable population groups.

Since the present coverage of health services is limited and a substantial percentage of the needy population is not reached through them, the primary health care approach, now being promoted and supported by WHO and implemented by most developing countries, offers a basis for the expansion of those activities and measures concerned with the primary prevention of malnutrition. The primary health worker should play a key role in this respect by integrating the nutrition components into the health activities at the community level. Another area of responsibility of the health sector relates to its participation in the assessment of the results of food and nutrition plans and programmes, the monitoring of changes, as well as the prediction of future trends for the nutrition problems in a country. A nutrition surveillance system could be established for this purpose which should include both health and non-health indicators.

5.3 The role of the health sector at different levels

5.3.1 *Responsibilities at the national level*

The health sector's responsibilities at the national level include:

—definition and analysis of nutrition problems;
—promotion of multisectoral food and nutrition strategies and programmes;
—participation and cooperation in the implementation of the above strategies and programmes;
—participation and cooperation in the establishment and operation of a food and nutrition surveillance system.

5.3.2 *Definition and analysis of nutrition problems*

The health sector has to play an important part in the definition of nutrition problems at the national level, and its efforts should be linked with those of other sectors engaged in related assessments. The analysis should include the magnitude, distribution, causes and effects of nutritional deprivations on the individual, the community and the country as a whole, and their impact on the national economy and on other developmental sectors.

The diagnosis of nutrition problems of the population is traditionally limited to the measurement of nutritional diseases or conditions (e.g., protein-energy malnutrition, anaemia, goitre, xerophthalmia) by means of conventional rates of morbidity and mortality; to these indicators may be added growth failure as a measure of physiological alteration. This approach, however, presents only a portion of the true impact of nutrition on health status. The contribution of nutrition to infectious disease, reproductive performance, mental development and other aspects of health status must also be recognized if the real magnitude of the problem is to be assessed and sufficient resources allocated for a permanent solution. There is thus a need for better estimates of the influence of nutrition on other disease parameters if appropriate priorities are to be assigned to this programme area by health planners. While the relative contribution of nutrition to other health problems will vary according to local and regional conditions, reasonable estimates could be made on the basis of existing evidence. While initial estimates would inevitably be tentative, accumulated experience would progressively improve them until they reach acceptable levels of reliability.

In addition to the estimation of the indirect effect of nutrition on other health/disease indicators, there remains a need to improve the quality of conventional health statistics in relation to nutrition reporting. It is widely recognized that deaths and hospital admissions arising from severe malnutrition are regularly recorded only under the diagnosis of the superimposed infection or other complications. Attempts to encourage the reporting of malnutrition as a secondary or contributory cause of death or hospital admission have met with limited success. A case may be made for routine classification of nutritional status together with, but independently of, the primary diagnosis in death certificates and hospital records. Finally, in the assessment of the impact of malnutrition, efforts should be made to consider, even if not in precise quantitative terms, the effect of nutri-

tional deficiencies on the learning capacity of children, on the work efficiency of adults, and on reproductive performance and similar functions of vital importance to the general wellbeing of individuals and societies and the socioeconomic development of nations.

In terms of intersectoral collaboration in the area of nutrition, there is a need to develop appropriate health indicators to accompany the well developed range of indicators used by the agricultural sector to quantify food supply problems and to predict the magnitude of food shortages. The addition of health impact statements to accompany food supply predictions would do much to increase awareness of the central role of nutrition in community health.

The diagnosis of nutrition problems can be considered either in the broader context of identifying and quantifying the causal and contributory factors, many of which arise in non-health areas, or in the narrower sense of measuring the impact of nutrition problems on health status. In its discussion of this topic (see Annex 1), the Committee directed its attention principally to diagnosis within the health sector while recognizing that this measured only the consequences and not the causes.

5.3.3 *Promotion of multisectoral food and nutrition strategies and programmes*

The main objective of the definition and analysis of existing food and nutrition problems in a country (in terms of food and nutrient availability, food intake values, food habits and practices, prevalence and distribution of existing nutritional diseases as well as their causes and effects on different developmental sectors, priority areas and target populations, etc.) is to have a sound information base for adequate planning of effective strategies and coordinated multisectoral interventions to prevent and combat nutrition problems. It must not be forgotten, however, that the prerequisite for the implementation of a programme is its approval by the decision-making group (at the highest political administrative level of government) which has to allocate sufficient budgetary and other resources for nutrition plans and programmes to be incorporated into the national development plan.

With complete information in hand on the magnitude and effects of nutrition problems, the health sector should take the responsibility for disseminating this information widely, in particular to the politicians, including those at the highest levels of executive authority, in

order to call attention to the need for a national nutrition policy and plan and to obtain final approval for such a plan. The facts should be presented objectively and clearly, supported by statistical data, pictures or other illustrations and, whenever possible, by charts showing changes and trends. The aim is to provide motivation for increased and clearly defined efforts to control nutritional problems as part of a national strategy for accelerating socioeconomic development.

In fact, health workers at all levels have a major responsibility for assembling and disseminating this information. Being in permanent and direct contact with the problems of malnutrition, health workers can recognize them and easily identify the unfavourable effects on the health sector and other sectors. However, this is not the case with workers in the other (non-health) sectors; the objectives and goals of their programmes are often not biologically oriented or directly linked with individual physical wellbeing.

It is thus important that workers and particularly planners in these other (non-health) sectors should be aware of the unfavourable impact of malnutrition on the national economy, agricultural productivity, educational performance and social stability, and should understand how nutritional deficiencies constitute a real obstacle to socioeconomic development. It is clear therefore that to introduce nutrition components and orientation into these other sectors' programmes and to facilitate multisectoral coordination, the health sector should take the responsibility for disseminating basic information on nutrition problems and their causes and effects, particularly to policy-makers and sectoral planners.

5.3.4 *Participation and cooperation in the implementation of food and nutrition strategies and programmes*

The health sector should closely collaborate with the central planning office to provide the necessary health input in overall food and nutrition planning. In the planning and implementation of programmes for the improvement of food supply, food demand and biological utilization, different sectors must obviously be involved. The health sector's prime responsibility is in the area of biological utilization but it can also cooperate in complementary activities in the other areas.

The health sector has the responsibility at the central level to identify and recommend specific strategies and relevant measures for correcting the problems that have been identified. While only part of

the possible measures for dealing with malnutrition falls within the sphere of action of the health sector, it is important that this sector should stimulate and cooperate with other sectors in relevant nutrition-related measures and also promote the consideration of nutrition-oriented objectives in the programmes and projects of the other sectors.

In relation to certain specific nutritional deficiency diseases, the strategy and measures to be taken should be planned and carried out at the central level. In order to control endemic goitre and cretinism, nutritional anaemia, and vitamin A deficiency, the health sector may have to develop and implement national programmes. Examples of such programmes are iodization of common salt for the control of endemic goitre and fortification of appropriate food vehicles with vitamin A or iron for controlling xerophthalmia and nutritional anaemia. These measures are in general of low cost and, once established, may give quick and significant results. In some countries the implementation of such measures may not be under the direct responsibility of the health sector; however, the promotion of the measures, the technical advice on levels and procedures for the fortification, and the follow-up and control of the programme are clearly the health sector's responsibility. Mass media campaigns against malnutrition are also a component of national programmes to be implemented at the central level by the health sector.

5.3.5 *Participation and cooperation in the establishment of a food and nutrition surveillance system*

The health sector should also play an important role in building a data support system for nutrition planning. In order to be most useful, such a system should be based on continuing data collection, i.e., a permanent nutrition surveillance system,[1] and not on a single or intermittent surveys. In some countries there are already well-established health and agriculture information systems. Efforts should be made to incorporate them in the food and nutrition surveillance scheme in order to avoid duplication of reports and data. In many countries,

[1] It is useful, for the purposes of description, to distinguish between the longitudinal *monitoring* of individuals (as a means for assessing individual health performance, care needs and responses) and the *surveillance* of groups, communities and populations (in respect of their collective health status) for the purpose of priority assignment, resource allocation and response evaluation.

the health sector has national nutrition institutes which may be assigned an important role in the national data support system. These institutes should be integrated, as an important technical support group, into an effective decision-making process, in order to ensure their full involvement and participation.

At the national level, the diagnosis of nutrition problems is, in general, dependent on the use of data collected at the local level. Where nutrition reporting or surveillance systems utilize routinely collected data, the accuracy of diagnosis of the problems will only be as good as the quality of the data collected at the periphery. Such data, derived from health service records, can usefully form the basis for multilevel surveillance systems whereby local level data are collated, analysed and interpreted at the intermediate (regional) and national level. Such a process permits the identification of geographical problem areas and, if accompanied by appropriate data, of socioeconomic strata within or across such areas.

In surveillance systems of wider scope, health data can be analysed and interpreted in conjunction with data from other sectors, thus permitting a more comprehensive assessment of the problem and its contributory factors. Such multisectoral systems also permit predictive analysis on the basis of trends and the known relationships between variables (e.g., decreased food supply—increased prices—decreased consumption—deterioration of nutritional status). Regardless of the scope and complexity of nutrition surveillance systems, data of adequate coverage and quality, properly analysed and reported, are essential to the subsequent steps leading to decision-making and the allocation of resources for nutrition programmes.

5.4 Responsibilities of the health sector at the community level

During the past decade, a very promising trend towards multisectoral planning and implementation of food and nutrition programmes has evolved. The intersectoral joint responsibility for the prevention and control of nutritional deficiency diseases has been accepted and there has been steady progress in national multisectoral nutrition planning in several developing countries. Although it is recognized that this multisectoral approach is fundamental, the responsibility and involvement of the health sector in nutrition programmes continue to be of critical importance, both in the national planning process and at the local operational level. A sufficient availability of food at national and local levels and a substantial increase in family income

do not by themselves eliminate nutrition problems. Availability of food and money at family levels is a necessary, but not sufficient, condition for the prevention and control of malnutrition.

Many cultural factors (such as erroneous feeding habits, inappropriate practices and beliefs related to health and disease, inadequate child-rearing practices, and reproductive behaviour) are strong determinant factors of malnutrition, which are usually very difficult to eliminate. The health sector has a definite responsibility to carry out extended programmes of nutrition education and health education in order to eliminate these causative factors. On the other hand, the synergistic action of malnutrition and infection stresses the key role of the health sector not only in the diagnosis and treatment of malnutrition but also in the control of the determinant factors.

It is convenient, however, to distinguish between factors that condition malnutrition and those that precipitate acute malnutrition and death. The geographical and socioeconomic factors which result in the final consumption of food at the individual level undoubtedly condition both the type and extent of malnutrition, but in themselves do not explain the high mortality rates seen in many parts of the world where malnutrition is prevalent. Diarrhoeal diseases and infectious diseases are common precipitating factors. Superimposed upon a background of undernutrition, these diseases are major setbacks in growth and development and can even lead to death. The precipitating rather than the conditioning factors are undoubtedly responsible for much of the high mortality, and perhaps also the severe forms of malnutrition, among children under 5 years of age. The responsibility of the health sector in the prevention of malnutrition is related to both the food factors, which are among the conditioning factors, and the non-food factors, which are among the precipitating factors leading to the appearance of severe forms of the disease.

5.4.1 *Identification of malnutrition at the community level*

The first task of the primary health care worker arriving in the community under his or her responsibility should be to get to know the community, to visit the households and be in contact with the people, and to have a rough assessment of the existing health and nutrition problems and available resources at local level. An excellent practice in this respect could be, for instance, to carry out a house-to-house survey of the weights (by age) of children under 5 years old,

using a simple weighing scale. Even if the data obtained are not of the greatest accuracy, they will give the worker a general profile of the nutritional status of the young children in that community and will clearly identify the families at higher risk—namely, those with cases of second- or third-degree malnutrition.

The use of simple anthropometric measurements, such as weight, height, and arm circumference related to age or to each other (weight-for-height, or arm-circumference-for-height), can give relatively accurate orientation of the current and past nutritional status of the children. Similarly, the monitoring of weight gain during pregnancy can provide adequate information on maternal nutritional status and thus indirectly on fetal nutrition. Simple instruments (such as growth charts providing reference values for weight-for-age, height-for-age, weight-for-height, and weight gain for gestational progress) have been developed in many parts of the world for the use of primary health care workers. An important aspect of many of these growth charts is that they are designed to be kept by the mother, thus involving her in the monitoring process and educating her as to its benefits.

The growth chart thus provides a simple instrument whereby the primary health care worker can confirm, record and report his diagnosis in objective or numerical terms. By similar means the preliminary diagnosis of other common nutritional disorders such as goitre, anaemia and xerophthalmia can be placed within the capacity of the primary health care worker.

5.4.2 *The control of food factors at the community level*

Along with the traditional maternal and child health services as well as health education and family planning, food and nutrition activities should be an integral part of the "package" of health services delivered to the community at local level. This food and nutrition component relates to two main types of intervention in addition to the monitoring of nutritional status of mothers and children)—namely, nutrition education directed to ensure a complete and balanced diet and supplementary feeding (when required) for those groups who cannot obtain by themselves the foods needed to meet their nutritional requirements.

The mother should receive support and, if needed, appropriate advice on how to prepare herself for breast-feeding and also on the techniques of infant feeding at the weaning period and afterwards.

The more the mother knows about the process of pregnancy, breast-feeding and child care, the better she will be able to feed and care for her baby. Thus, the primary health care worker should have a special concern for the diet and nutrition of the pregnant woman and the newborn. A combination of monitoring maternal weight gain, advising on her diet and, when indicated, providing food or nutrient supplements (particularly during the last trimester of pregnancy) includes the ideal components for nutrition promotion for pregnant women at the community level. In the field of nutrition education and health education should be included, when required, the promotion of breast-feeding, guidance on infant and young child feeding (such as the use of appropriate and timely complementary feeding and weaning), and advice on a balanced distribution of the available food within the family. It is well known that during the prenatal period the mother is very receptive to advice and new knowledge related to child feeding, child-rearing practices and child development. The primary health care worker should take full advantage of this fact.

The identification of "families at risk" on the basis of the presence of children with second- or third-degree malnutrition, and other adverse circumstances (such as unemployment, abandoned mothers and extreme poverty) will give to the primary health care worker a good frame of reference for the selection of beneficiaries in supplementary feeding programmes. The distribution of iron tablets to all pregnant mothers and capsules of high-dosage vitamin A to children in order to prevent anaemia and xerophthalmia, respectively, are other examples of the control (at the local level) of food factors responsible for malnutrition.

5.4.3 *The control of non-food factors at community level*

The importance of the control, by the health sector, of non-food factors at the community level should not be underestimated. Very frequently the main determinant factor of the high prevalence of malnutrition in a given area or community group is not the lack of food at the family level or its inappropriate distribution within the family, but rather the insanitary environment in the household, the lack of personal hygiene, the lack of periodic health care, and failure to vaccinate; all these are aggravated by short birth intervals in the case of large families living in crowded quarters, without adequate water supply, sewage facilities or refuse disposal. An adequate food supply in such families cannot by itself correct the situation. A balanced

food intake will be ineffective in the presence of inadequate utilization of nutrients which is due to repeated infectious diseases and frequent diarrhoeal episodes.

The traditional activities of primary and secondary prevention, particularly through the MCH services at community level, will control these non-food factors. These activities include the monitoring of health, growth and development, early diagnosis and treatment of diseases, immunization programmes, prevention and control of diarrhoeal diseases, oral rehydration, deworming, family planning activities, health education, environmental sanitation programmes, and the opportune referral of cases to higher levels of health care.

6. COLLABORATION WITH OTHER SECTORS FOR INTERSECTORAL ACTIVITIES

6.1 Nutrition as a component of national development

The state of health of a population is a reflection of the level of social and economic development attained by their country. While this fact may have been known for a long time, it was only during the past decade that it came to be explicitly stated; for example, the Declaration of Alma-Ata says that "the promotion and protection of the health of the people is essential to sustained economic and social development and contributes to a better quality of life and to world peace" (6). The General Assembly of the United Nations also, in resolution 34/58 (adopted in November 1979), recognized health as an integral part of development. The state of nutrition has been widely recognized as being a major influence on health conditions in developing and industrialized countries alike, but the various sectors of governments have fallen behind in applying positive measures of action.

Even if the importance of nutrition is recognized and the corresponding goals and objectives are defined in a country's development strategy, there may be no action at the operational level unless administrative structures are changed. Perhaps one of the greatest problems in food and nutrition strategy development is effecting changes so as to permit a retention of sectoral independence in programme management while ensuring interdependence in design and operation to meet the goals and objectives.

The economic sectors within governments often retain a paternalistic attitude and emphasize monetary and fiscal policies. There is thus a great need for nutritional indices and considerations to be incorporated into the economic planning process. If the development goals are to be made operational, monetary and fiscal policies must be changed frequently; today there is often a lack of awareness of the ill-effects of a static policy. The health sector has traditionally concentrated on curative medicine and on the socioeconomically better-off sectors of society. Agricultural sectors have traditionally concentrated on the producer and the product with less emphasis on the basic developmental question of "who produces for whom at what cost?". The educational sector has traditionally concentrated on formal approaches and been little concerned with problem-solving and non-formal education.

Local leadership, local resources and the influence of local demands on the political leadership can be mobilized by the local administration sector of governments. It is at the local level that the various sectors should converge and work together directly with the people. If community participation is to become a reality, control must be vested in the community. Some countries, recognizing the importance of a dual control system, have vested administrative authority at this level, including the authority to hire or fire personnel, with technical guidance still being provided by the relevant sectors of government. The sectors not directly administered or controlled by government, such as voluntary groups concerned with women, youth or children, can also play a very important role in improving nutritional conditions if they are given the opportunity.

6.2 Ensuring coordinated food and nutrition strategies

Clearly the food and nutrition problems of countries must be tackled in an integrated manner and not separately. This approach was discussed by a previous Expert Committee (*8*). At the same time, concentration on the direct improvement of nutritional status must not inhibit policies designed directly to alleviate poverty, which is a major cause of inadequate diets. A food and nutrition strategy should be one part of the overall development strategy and must be relevant to and integrated with the development planning cycle of the country.

The health sector has a major responsibility for identifying the nature and extent of the nutrition problem. It therefore has special

functions (advocating the cause, and gathering and disseminating information) in multisectoral food and nutrition planning, but not necessarily an overt leadership role: its responsibility for promoting cooperation—to ensure that the other sectors play their part in setting targets and priorities and in developing and implementing the food and nutrition strategy—entails enabling the other sectors to assume leadership, when appropriate.

Food-price policy is an important issue for many countries—poor people need cheap food, and farmers need good prices to encourage them to produce the foodstuffs that are needed (not just for themselves and their families). Farmers often demand a considerable increase in prices if they are to produce enough of specific foods. Consequently consumer price subsidies are sometimes provided to offset this. If a government considers such an approach, it is important that the subsidies should help those really in need—namely, the poor or the poorest of the poor (usually in the rural areas) who are in greatest need of cheap food. Food subsidies, particularly on imported foods, too often inhibit the local farmers from increased food production; sometimes the main beneficiaries are the richer town dwellers. The health sector has therefore a particular responsibility to advise on food-subsidy policies in relation to the food and nutritional problems and goals of the country.

6.3 National food and nutrition councils

A national food and nutrition coordinating council is found in many countries (although the title varies) and has the function of monitoring and ensuring implementation of the national food and nutrition strategy. The council needs technical inputs from sectorally-based nutrition departments or units and must have its own budget. Usually the most active nutrition departments are in the ministries of health and it is important that this should not result in a policy dominated by health considerations.

The health sector has in the past often concentrated on the clinical aspects such as mapping out the nature and extent of malnutrition, which does not by itself provide data relevant to the non-health sectors; it does not, for example, delineate the socioeconomic and agronomic causes of nutrition problems. Consequently, "expertise points" or sources of expert opinion should be developed in each of the relevant sectors outside the health field—especially those concerned with agriculture, education, and local administration or com-

munity involvement. These "expertise points" can, together with those from the health sector, provide material for intersectoral diagnoses and technical support to the council. The health sector has a specific responsibility to encourage this kind of a technical multibase, which is an essential prerequisite for the functioning of the food and nutrition coordinating council. It also has a responsibility to define clearly its own role in order to deal with nutrition problems as they exist and to modify its own structure and functions accordingly.

If the national food and nutrition councils have no clearly defined and important functions, they are likely to decline in quality of membership and in their work. The technical inputs from nutrition units are important in providing the councils with information so that they can function effectively. One such function, for which the health sector has a particular responsibility, is to review the food and nutrition situation regularly, using information derived from a national food and nutrition surveillance system. Such a system enables each sector to have its own data presented in a form suitable for nutrition review and planning. This encourages the sector itself to be concerned about its responsibilities for improving nutritional wellbeing.

6.4 Issues in collaboration

Collaboration has its dangers and some of these have been referred to already in this report. There should be clear benefits to each collaborating sector and organization, otherwise there will only be discussions without results. In the final analysis there should be clear benefits to the people.

Collaboration that shows benefits will inevitably result in some change in responsibilities. A willingness to make sacrifices in exchange for the overall good is as necessary as, for example, the avoidance of useless expansion of departments. Unless each sector can see the fulfilment of its own objectives through collaboration in an intersectoral food and nutrition strategy, it will be unwilling to compromise and make the necessary sacrifices. Unless the sharing of authority is dealt with very carefully, there could be ill-feeling and unproductive conflict. Fruitful collaboration may result in more funds accruing to the agencies or in increased recognition. A fair distribution of such benefits, as well as an acknowledgement of the inputs, must be made so that all who cooperate, and not just the leader, are given full recognition.

Cooperation must start at the very beginning of programme development and should not be introduced at a late stage when the agencies and individuals will be less inclined to welcome it. This implies that there should be effective and continuing exchange of information among the cooperating agencies from the beginning, as well as mutual agreement on the operational procedures for the collaborative mechanism. Commitment to coordination can be facilitated through publicity, through political decisions, and through seminars as well as through the mechanisms mentioned previously. The outputs of such coordination must be clearly stated as objectives of real social benefit and these benefits must be clear to both policy-makers and implementors.

7. THE ROLE OF EXTERNAL COOPERATION

On the subject of external cooperation with governments in health and nutrition, the Expert Committee discussed the role of (1) multilateral organizations, (2) bilateral agencies, and (3) nongovernmental institutions. The first group is related to the United Nations system and regional organizations. The second comprises governments that export capital, goods, technologies, and services. The third group, including philanthropic or nonprofit organizations, is usually related to the private sector providing food and technical services.

One of the roles of WHO is to provide norms for the peoples of the world in order that they may improve their health. For this reason, WHO, in collaboration with other agencies, has to concern itself directly with nutrition, which is an important component of health. In the fulfilment of its particular responsibilities, WHO should be guided by certain general principles which apply to all forms of external cooperation; the following were considered by the Committee:

(1) To call the attention of the world community to the symptoms and causes of malnutrition, emphasizing that the causes are usually rooted in poverty. In this regard, it was agreed that the international community as a whole had already been active, particularly in the last ten years, for there was now greater awareness and consciousness, among people and their governments, of malnutrition and its deleterious effects.

(2) To respect the sociopolitical structure of countries and the decisions of governments. There have been cases where agencies have

tried to impress upon local authorities their own perceptions of problems and approaches, and offered assistance only with regard to these aspects.

(3) To strengthen national competence and resources, and to avoid the creation or maintenance of a state of dependence. Food aid is a case in point; the goal should be for countries and communities to become self-supporting and self-reliant.

(4) To foster and facilitate intercountry cooperation, thus transmitting positive and negative experiences. One road to progress is to learn from past mistakes. The international community is at present involved in these activities through seminars, workshops and short-term consultancies, and by facilitating training and disseminating key documents. In some regions, this sort of intercountry cooperation is actively promoted by nutrition institutes with a truly international staff and deal with the prevailing problems through research and training.

(5) To promote and facilitate national intersectoral coordination and cooperation in relation to food and nutrition. This may entail not only technical inputs but also funding.

(6) To implement the resolutions of the governing bodies of international agencies. These resolutions are the collective views of Member governments and indicate what they expect from the respective organizations. They are valuable instruments for sensitizing decision-makers and for creating an appropriate environment for the national professionals to work in.

(7) To suggest alternative solutions to the priority problems or stimulate and support operational research needs (as identified by governments) for determining these solutions.

Another matter concerning external cooperation called for comment. It is argued that, at present, multilateral agencies are playing a rather passive role—waiting for requests to come from governments in order to initiate cooperation—and that they should be more active in identifying to the national authorities the problems and attendant technologies that are of significance, thereby helping to reduce the toll of death, disease and disability induced by nutritional deficiencies. In some cases, the governments may even expect a more direct and concrete expression of collaboration. Considering these attitudes and the above general principles, the Committee discussed the following activities for cooperation, many of which were already in operation but not sufficiently to influence the malnutrition situation in the places where it was most prevalent:

(1) Suggesting and cooperating in the formulation and implementation of national food and nutrition policies and attendant plans and programmes.

(2) Strengthening the capacity of governments to analyse and define nutrition problems, to design and plan programmes and projects, and to implement and evaluate them. As a result, the ministers of health would be in a better position to mobilize governmental resources, motivate public opinion and community participation, and request specific international cooperation. Agencies could collaborate to this end by:

(*a*) Supporting the creation of or strengthening the mechanisms for multisectoral planning.

(*b*) Facilitating the coordination of external agencies. There is still plenty of room for improving the effectiveness of joint inputs of external cooperation. Governments should be responsible for coordinating the agencies on the basis of programmes and projects that contain specific objectives commensurate with national and, when needed, international resources. For this most important role, external cooperation may be needed and should be granted.

(*c*) Stimulating the creation (at the ministries of health) of a body dealing with international health and related activities, like that already in operation in some countries.

(*d*) Organizing workshops or seminars for high officials to enable them to analyse the scope of the food and nutrition problem and rational approaches to deal with it.

(*e*) Training staff, at all levels in the country and abroad, particularly in relation to the needs stemming from formulated policies and their corresponding programmes.

(3) Stimulating international capital investment in food and nutrition and cooperating with governments in its efficient utilization. Nutrition should become "bankable" and projects should be formulated accordingly. The creation of a centre for designing and financing nutrition projects, following the guidelines of the major capital investment agencies, was strongly recommended. The centre might be located, for instance, in WHO and organized in a similar way to the investment centre for agricultural projects, sponsored by FAO and the World Bank. Mention was made of soft loans (e.g., by the United States Agency for International Development (USAID) and others) for multisectoral planning, implementation of specific programmes, and surveillance.

(4) Responding to requests for specific identified programmes within a national policy.

(5) Periodically updating the state of the art in respect of the various major food and nutrition problems and the methods to deal with them.

(6) Developing methodologies or models for the following purposes:

(*a*) for the diagnosis of nutrition problems (there is need for research on nutrition indicators, human requirements of energy and essential nutrients, measurements of the actual contribution of diets—or the lack of them—to the outcome of infections, intellectual development, school performance, and labour productivity);

(*b*) for the planning of programmes and project designs to be used by development planners in the health and nutrition fields and for the development of strategies in all sectors concerned;

(*c*) for the integration of health and nutrition in community development;

(*d*) for the identification of families at risk and those that could become so;

(*e*) for the evaluation of structures, processes and outcomes;

(*f*) for effective delivery systems including administration and management;

(*g*) for the assessment of needed human resources, both in quantity and quality.

(7) Serving as a focal point for assembling, collating and disseminating information on food and nutrition trends, thereby helping to improve the national information system as a basis for surveillance and planning. Thus, the agencies could draw attention to problems through the success or failure of programmes.

(8) Stimulating and supporting operational research geared to test the applicability of basic principles for improving the nutritional status of the people under local conditions. This entails supporting national institutes, and international centres serving groups of countries. The establishment of a network of international nutrition research centres concerned with food consumption and utilization was recommended in order to complement the excellent work carried out by the international agricultural centres with regard to food production.

(9) Disseminating scientific and technical information relevant to the countries' food and nutrition problems. Although this is at pre-

sent an active undertaking of the international community, the need is still great as witnessed by the very inadequate material in the libraries of many developing countries.

(10) Improving the dialogue within organizations (between related departments) in order to make better use of the available resources and to harmonize all their information and the recommendations made by them. Also improving, on a continuous and more active basis, the relationship between external agencies working on common problems. For this purpose, the creation of the Sub-Committee on Nutrition of the United Nations Administrative Committee on Coordination (ACC) was considered an effective approach, although it was felt that this Sub-Committee's endeavours should be better known by the governments and that there should be coordination of the agencies' programmes at the country level also.

For such a wide range of responsibilities to be carried out by the international community, the present level of investment was considered by the Committee to be totally inadequate. As happens in other international organizations, the allocations to individual programmes (in this case, WHO's nutrition programme) are relatively small in relation to the magnitude of the problem. Without improvements in the nutritional status of the people in the developing societies it will be impossible to reach the agreed and hoped for goal of "Health for all by the year 2000". The Committee suggested that "Food for all by the year 2000" should be a parallel theme to be implemented in these last two decades of this century. Although the goals are primarily the responsibility of the people, wisely assisted by their governments, the international community has a significant role to play for which more resources are urgently needed. An important starting-point should be to raise the level of priority for nutrition. International agencies can only make recommendations to governments regarding priorities, structures, functions, and resource allocations if the agencies themselves set an example in these respects.

8. CONCLUSIONS

The Expert Committee recognized that the field of nutrition is a primary responsibility of the health sector, a fact that is endorsed in the Declaration of Alma-Ata, which includes nutrition among the basic components of primary health care. Some important developments in the past decade, however, have justified a review of how the

health sector could more efficiently contribute to the solution of nutrition problems. Among these developments the following trends were seen to be particularly relevant.

There is now greater awareness at both national and international levels of the magnitude and severity of the problem of malnutrition and of its health and social consequences. There is also a greater understanding of the fundamental causes which are primarily of a socioeconomic nature. In addition to nutritionists and health workers, sociologists, economists, developmental planners and others from many different sectors in society have become interested in nutrition. The concept of a multidisciplinary, multisectoral approach to the problem of malnutrition, within a country's socioeconomic developmental effort, has thus emerged.

All these are positive developments. Nevertheless there is a danger of neglecting the urgent needs and individual sectoral responsibilities, particularly those of the health sector. While the ultimate solution to the problems of malnutrition lies in socioeconomic development, the children who are dying now or becoming handicapped because of malnutrition cannot be expected to wait, nor can mothers who are giving birth to malnourished babies and who are themselves exposed to greater risks during the reproductive process. These problems, including the negative effects of malnutrition on work performance in the labour force, are a constraint in national efforts towards socioeconomic development. It is therefore urgent to analyse what the health sector could and should do, under the present conditions, in order to alleviate the immediate problems as well as to contribute to the long-term development goals.

The primary health care strategy provides new opportunities for nutrition initiatives that could be supported by the health sector because, in the first place, this strategy solves the problem of coverage which has frequently been one of the greatest constraints on effective action in this sector; it recognizes the need for a multisectoral approach to health promotion at the community level; and it emphasizes preventive measures and is based on the active participation of the community in solving their problems. All these aspects are particularly relevant to food and nutrition problems. Appropriate technology based on scientific knowledge—feasible in implementation, and relevant to the problems to be faced—needs to be introduced. The principles and philosophy of primary health care have therefore now to be translated into action for the improvement of the community's nutrition status.

While there is a need to increase food production, significant improvements in dietary practices can now be obtained in most situations, within the available resources. Here the health sector can play a vital role, particularly in support of small children who are the most afflicted. The Committee also recognized that an insufficient or inadequate food intake was not the only immediate cause of malnutrition. Other factors such as infectious and parasitic diseases (particularly the diarrhoeal diseases) and short birth intervals can be important influences. Nutrition activities—including specific measures for dietary improvement which should not be neglected—should therefore be properly integrated as far as possible with these other health activities.

Finally there is the problem of re-examining responsibilities in regard to nutrition activities and of looking for new alternatives. Some useful experience has been obtained through epidemiological studies; there is now a need to translate this experience (from population samples) to countries or regions as a whole. To do this the nutrition component of health services, particularly at the primary level of health care, needs to be strengthened. At the same time, the health sector has the specific responsibility to advocate and support coordinated multisectoral food and nutrition strategies and to provide the required information on malnutrition problems and their consequences. This sector should also promote external cooperation, when required, and ensure that such cooperation is directed towards solving the nutrition problems of the people in greatest need, strengthening national competence in this field, and making the communities more self-reliant.

The present report describes the Committee's views on the role of the health sector in food and nutrition, and it is hoped that it will be useful as a general guideline to public health administrators. It does not attempt to provide specific norms, which can only be developed by taking into consideration local characteristics; nor does it pretend to be an exhaustive review of available knowledge and experience in regard to nutrition in health services.

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Annex 1

DIAGNOSIS OF NUTRITION PROBLEMS

The diagnosis of nutrition problems at the level of the individual, the community and the population, as well as at the international level, is a fundamental responsibility of the health care sector. These problems are inevitably multifaceted and, at the community and population level, the major causal and contributory factors lie outside the health sector's area of influence. Identification of problems at the individual level, however, should take into account the dietary as well as the sociocultural and environmental factors involved, and should lead to recommendations for the health worker on their solution and prevention. In the field of primary health care, such problem identification should be based on simple technology which is within the capacity of the trained worker.

The diagnosis of the nutrition problems of a country should not only include the extent, types and degrees of malnutrition, but also identification of the areas where its prevalence is high and where the population is more affected, as well as additional information about the main determinant factors. The definition of contributory and precipitating factors in the most affected areas and population groups should give a sound basis for the implementation of effective strategies in each case.

To *define the extent, types and degrees of malnutrition in a country* is a primary responsibility of the health sector at the central level; this responsibility should be shared with the other sectors (in close collaboration) so that the problem could be placed within the proper framework of its different sectoral components. Diagnosis of the problem will be more useful if it is based on a functional classification of the malnourished, in order to define not only the various types of malnutrition in both qualitative and quantitive terms, but also the groups of population affected and their characteristics, as a basis for deciding on the corrective action needed.

Precise definition of the problem is crucial since the nutrition objectives and goals have to be expressed in terms of health status, e.g., the achievement of target rates of infant or childhood (1–4 years old) mortality, birth-weight levels, growth of children in height and weight, reduction in the prevalence of nutrition-related diseases, etc.

Given below are the most significant indices for evaluating the nutritional status of population groups. Each one has its advantages and limitations, and they all complement one another. A judicious combination of the data thus obtained can reveal a fairly precise picture of the nutritional status of the population concerned.

Anthropometry provides, particularly in children, a basis for assessing their nutritional status. Linear measurements of body size, such as height (or length) and head and chest circumference, may indicate previous nutritional deprivations over a long period. Measurements of tissue mass (such as body weight, arm circumference, and skinfold thickness) are more likely to reflect the present situation or recent nutritional history. While national or regional norms would be ideal as a standard for comparison of anthropometric data, they are not available for most countries, and their production presents an extremely difficult and time-consuming task. However, international standards can be used since deviations from them may be due more to environmental factors (including nutrition) than to genetic characteristics.

Health service records are among the many possible sources of data for the assessment of nutritional status. In many countries, a wealth of information is available from this source, though sometimes in a rather unstructured form.

Vital statistics are a good source of data for a quick assessment of the problem. Mortality data, especially age-specific mortality rates, can be very useful. In spite of their limitations, infant and child mortality rates are usually good indices of nutrition-related health problems. In conjunction with environmental and socioeconomic data, and in the context of a functional classification of the population, these rates will help to identify measures in child health care for specific groups and communities.

Estimates of food and nutrient availability, expressed in terms of the per capita availability of calories and nutrients for the whole country, are average figures and do not point to possible problems of food availability (by geographical regions or population groups) in the country and so will not help in identifying the problem areas. In recent years, food availability data have shown that, in many countries where malnutrition is prevalent, there is enough food (in total) to meet everyone's need for energy, protein and other nutrients. The problem is the unbalanced food distribution in certain regions, or among families of different social strata, and even within a single family. Thus, having a sufficient total food supply in a country does not by itself ensure the elimination of malnutrition. The most

important step is to ensure that the food is made available to all the people who need it.

The *assessment of food intake* in a community provides important evidence of the presence of groups who are at risk of malnutrition. This information is of importance to planners, since the gap between the actual food intake and the physiological requirement will indicate the extent of nutritional deprivation, taking into consideration the demographic structure of the population, anthropometric values, and levels of activity. Further improvements in the methodologies for estimating dietary intakes and more knowledge about the physiological requirements (so that data could be interpreted with greater confidence) would increase the value of this indicator. Emphasis should be placed on the importance of data from individual and household surveys, because only these will point to the groups of people at risk or with definite nutrition problems. Similarly, an adequate knowledge of *local food habits, attitudes and practices* (relating to nutrition, health, child-rearing, child-spacing, etc.) will give a sound basis for interventions in nutrition-and-health education or other required measures.

It has been fully recognized that malnutrition is a social disease whose main and immediate cause is poverty and the concurrence of various adverse environmental circumstances. However, these determinant factors vary from place to place and nutrition interventions should take account of them. A broad set of community and family socioeconomic data should be included as basic information for nutrition planning. Income distribution data, the percentage of the family budget expended on food, type of employment, type of housing and environment, availability of drinking-water, sewage and garbage disposal, family size, parents' education level, etc. contribute essential information for nutrition planners. On this basis, it is possible to identify the *target areas or population groups*, for whom the mutually potentiating effect of simultaneous, multisectoral interventions will lead to better end-results.

For the identification of target populations, the search for "*families at risk*" would be more rewarding and more realistic (given the scarcity of resources for nutrition programmes) than assessment of all the individuals of a given age or physiological state. Obviously, within these families, special attention should be given to the most vulnerable groups (infants, young children, pregnant and nursing mothers). The criteria for the identification of "families at risk" should include a range of biological, environmental and socio-

economic factors, such as the presence of second- or third-degree malnutrition, large number of children under 10 years of age, abandoned or unwed mothers, unemployment, living in a slum area or poor rural community, low income, etc., thus providing (what has been called) a functional classification of the malnourished which can help in identifying the target population and the required actions.

The *health sector's role* is fundamental in all the steps dealing with the identification and analysis of the food and nutrition problems of a country. This role includes collection of existing data from the health sector and other sectors, execution of specific basic surveys and studies, participation in and advising on studies involving other sectors and areas such as food balance sheets, adjustment of recommended nutritional allowances, and recommendations on criteria for the identification of target areas or groups.

Defining the problem at the community level

In the past, the formal diagnosis of nutritional status and disorders at the individual level was the exclusive responsibility of the physician or graduate nurse. Today, with the recognition of the validity and reliability of anthropometric measurements as indicators of nutritional status, the diagnostic capacity of primary health care services has been greatly expanded by the use of growth charts.

At the community level, the diagnosis of the nutrition problem is now seen as a responsibility of the primary health care worker, assisted by other levels of the health system. Growth charts can be used to record the distribution of anthropometric measurements in cross-sectional studies, thus permitting the simple categorization of the distribution according to a pre-established classification, or the monitoring of the growth of individual children. Extensive field studies show that these charts provide a useful means of assessment and also of education, particularly when the mother is involved.

The value of clinical surveys is limited to diseases in an advanced stage, and in most populations such cases are usually rare. Clinical signs as a basis for diagnosis are further limited by the difficulties of standardization. However, carefully selected, easy-to-detect, clinical signs can be used by health auxiliaries for nutrition screening and surveillance at the peripheral level if the workers are properly trained and supervised.

Annex 2

MEASURES OF PRIMARY AND SECONDARY PREVENTION OF MALNUTRITION

Primary prevention deals with general and specific measures directed at avoiding the clinical appearance of disease. They could be measures of general promotion of good health and nutrition, such as nutrition and health education; or interventions for protection against specific contributing diseases, e.g., immunization against measles or the supply of iron tablets to prevent nutritional anaemias; or emergency supplementary feeding to prevent malnutrition appearing in disaster areas.

Secondary prevention relates to measures for early diagnosis of a disease after it has appeared and for its immediate control and treatment in order to avoid aggravation and further pathological disturbances or irreversible impairments. In practice, the health services conduct both primary and secondary prevention. Sometimes the two cannot be clearly differentiated, e.g., the supply of food supplements to a family could be primary prevention for some members and curative for others.

The health sector usually operates on three different levels of services: (1) the peripheral, based on primary health care; (2) the health centres; and (3) the hospitals. Activities of primary prevention are more frequently carried out at the first and second operational levels, while secondary prevention measures are more often the responsibility of the third or hospital operational level; at the community level, there is a great demand for curative measures.

In order to identify the measures for *primary prevention of malnutrition*, it is useful to analyse the process of normal human growth and development and the factors affecting them. The main periods of human development are as follows:

(*a*) The intrauterine period from conception to birth (normal duration, about 9 months) takes care of human development till the body is able to live in and cope with the external environment. If the baby is born prematurely or is insufficiently developed because of maternal malnutrition or other factors, he or she will be at a much greater risk of disease and death. Adequate maternal nutrition is therefore a first and fundamental need.

(*b*) Early childhood is the period when the child is still dependent, having passed from the "biological uterus" to the "social uterus". Infants, for example, must be fed (ideally, with their mother's breast-milk) and taken care of. The risks associated with artificial feeding (when breast-feeding is not practised or is abandoned too early) are very great, particularly when the socioeconomic and environmental health conditions are unfavourable. Other foods have to be progressively added as breast milk becomes insufficient to satisfy the child's growing nutritional needs, and eventually maternal milk is totally replaced by other foods (weaning process). This is also a nutritionally critical period because problems may arise from the too early or too late introduction of supplementary foods, or when inadequate foods are used, or from infections to which the child is particularly prone during this period.

(*c*) Later childhood is also important because it is a period of learning and preparation for adult life. It is the period when habits, including eating practices, are established and therefore needs special attention in this regard.

(*d*) During adulthood, the individual has both personal and family responsibilities. Adequate nutrition is fundamental for the effective performance of both these functions.

(*e*) In the final period of old age, adequate nutrition will prevent many complications and much suffering to which old persons are exposed.

These different periods of the life cycle can be altered in their duration and outcome by environmental factors, of which nutrition is one of the most important. Particularly in developing countries, malnutrition contributes to low birth-weight, high mortality and morbidity among infants and young children, inadequate growth and development, and reduced learning capacity during childhood; and in adults a low working capacity, high risks for mothers during pregnancy and childbirth, and a shorter life span. Efforts to correct these problems should be primarily oriented towards the promotion of adequate nutrition and the prevention of malnutrition (primary prevention), and should be specially aimed at women of reproductive age, infants and young children. Many of the tasks can be efficiently performed by the families and the communities themselves, with some technical and other support from the health and social services. Within the health system, primary prevention for malnutrition is mainly the responsibility of the primary health care and community level, with support from higher levels which also have a direct role to play.

Primary prevention: the role of education and other factors

The involvement of the formal education system in primary prevention of malnutrition, through the transmission of nutrition knowledge and the introduction of desirable nutritional practices early in life, is clearly essential. In addition, as far as possible the educational system should be organized and encouraged to provide continuing support to the informal educational activities undertaken by the primary health care system. The formal educational curriculum, particularly at the primary school level, should also include a consideration of community problems and needs and, where possible, elaborate on the activities undertaken by the health sector. Thus, the concepts and content of nutrition education should be harmonized between the educational and health care systems.

Although education is central to primary prevention, a *systematic approach* to the process of education is often weak or absent. It is therefore essential that the goals of any nutrition education activity or programme should be clearly defined, that there should be agreement and consistency as to content, and that appropriate translation of this content should be undertaken for different service situations. Furthermore, the nutrition education process should preferably be based on demonstration and, where possible, active participation of the target group. Thus, for example, it is important that mothers should be involved in appropriate aspects of food production, selection, and processing as well as in feeding practices and their effects. The value of having demonstrations (with the mothers' participation) as against traditional methods of teaching has been established in several situations. General education on important basic topics, such as breast-feeding, weaning methods and weaning foods, balanced family diet, foods for special groups (e.g., pregnant women), methods of control and prevention of infections, etc., should also be provided.

Family planning is a key adjunct of successful nutrition interventions, while the possibility of malnutrition (affecting the health of both mother and child) in turn helps in determining the acceptance of birth spacing. The view that the maternal depletion syndrome and lactation failure are the inevitable outcome of repeated short birth intervals is an important element in obtaining acceptance of and adherence to contraceptive measures. As a result of these considerations, population project staff increasingly look to nutrition workers for assistance in developing their programmes. This is a further reason for maintaining the major emphasis of primary prevention of mal-

nutrition in the area of maternal and child health. Nevertheless, though the latter is obviously a major focus of effort, nutrition activities should not be limited solely to this area, but should also seek new opportunities and approaches to prevention at the local level whenever they present themselves.

The importance of other sectors in primary prevention, particularly in the provision of an adequate food supply, is self-evident. The coordinating role of the health sector in this aspect of prevention is therefore vital at all levels of operation, especially at the local level. Similarly, adequate community organization and equitable distribution of resources within the community are essential prerequisites for the primary prevention of malnutrition, as they are for other aspects of primary health care.

The question of how much primary health care workers can actually do, given the increasing number of responsibilities and duties progressively assigned to them, has been posed. Inevitably, diagnostic and curative activities are given high priority in response to social demand as well as biological need; on the other hand, both preventive and time-consuming health promotional activities tend to be neglected or are carried out in a summary fashion. Consideration will have to be given to ways of achieving an appropriate balance in this area if nutritional activities are to be effective at the local level. In fact, the emphasis on primary or secondary prevention in the implementation of a primary health care programme should be given by the community itself, since "primary health care is essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford..." (Declaration of Alma-Ata).

Secondary prevention at three levels

The feasibility of measures for secondary prevention of malnutrition would depend on several factors, including resources available, local problems and priorities, type of organization and delivery of the health care system, type and level of personnel, training facilities, etc. The following are suggested measures of what could be done for secondary prevention at different operational levels. Although there is no real or clear-cut distinction between primary and secondary prevention of malnutrition, it must be stressed that emphasis should be on primary prevention.

At the first operational level, screening and individual surveillance of mothers and children are essential prerequisites for the institution of any preventive activities. The use of growth charts is a valuable tool by which children at risk of malnutrition or those who are already malnourished could be identified (indicated by a flattening or fall in the weight curve). A register of such children should be maintained at the health centre to facilitate the provision of priority care and follow-up. For such cases it is important to find out, through a detailed investigation, the possible reasons for and contributory causes of malnutrition and efforts should be made to overcome the problem. This may necessitate the treatment of minor ailments or accompanying disorders (e.g., repeated attacks of respiratory infection, fever, diarrhoeas) that are often associated with underlying malnutrition. The availability of supporting preventive measures, e.g., immunization, sanitation and adequate water supply, is equally important at this level.

The distribution of nutrient supplements is an activity that has often to be undertaken by the peripheral health worker. This could be in the form of distribution of (1) specific supplements, e.g., iron and folic acid for pregnant women either as a routine or where indicated, vitamin A for children in specified areas (clear guidelines on when to give these supplements should be provided to the community worker and an assessment made periodically of their impact in solving the particular nutritional problem), or (2) various types of food for women and children—such as milk, cereals, ready mixes as weaning foods, prepacked foods containing cereal, oil and pulses, biscuits, etc. (distributed through supplementary feeding programmes). The availability of such a programme depends on individual countries and their problems, priorities, resources and finance available, etc. It is important to establish criteria to ensure that these food supplements really reach those who are in need, making them the specific targets in distribution.

By far the most important activity in nutrition rehabilitation is education. The role of the peripheral worker as an educator and communicator is a basic and vital one. For secondary prevention, emphasis should be on nutrition education based on the local setting, i.e., sociocultural beliefs and values, food taboos, feeding patterns, locally available foods, etc. For an educational message to be effective, it must be aimed at a particular problem in hand and be specific and feasible.

Follow-up of these preventive activities in the community, by means of house visits for example, is necessary in order to assess the

local conditions and situations that precipitate or contribute to the malnutrition problem and to initiate measures to overcome the problem. Education and advice are best given to the family as a unit, with the objective of creating awareness and making them accept responsibility for the improvement of their health and nutritional status. Community-based preventive activities would also necessitate collaboration with other sectors and agencies, e.g., those concerned with social welfare, home economics, agriculture, veterinary matters, etc., so that an intersectoral approach could be used to solve problems, since malnutrition is basically a community social problem. Some cases of malnutrition may need referral to the health centre or hospital.

At the second operational level, which is usually the health centre level, measures for secondary prevention of malnutrition are basically similar to those at the first level, but would vary in intensity and quality depending on the numbers, category and training of the available health workers. Usually, more specific advice and interventions as well as curative and preventive activities can be provided at this level. As an example, the ambulatory treatment of uncomplicated, second- and third-degree cases of malnutrition could be carried out at the health centre level. There is also a need to train other members of the health team, who are not directly involved in maternal and child health care, in the diagnosis, management and prevention of malnutrition. They include medical assistants, environmental sanitation workers, etc., who often come into contact with mothers and children in their daily routine.

This operational level could also be responsible for community surveillance and for keeping a close watch over all who are named in the malnutrition register, which should be kept in the health centre. In community surveillance, measures should be taken to screen all mothers and children in order to identify "at-risk families", including those that do not come to the clinics. Collaboration with voluntary organizations and community groups could aid in the performance of this task.

The second operational level also plays an important role in the provision of supervision and technical guidance to health workers including those at the community level. Local guidelines on diagnosis, management and prevention of malnutrition could be made available and supervision provided as a means of continuing education and support. Training (in the form of in-service training courses, refresher courses, case-study meetings, etc.) is another important activity at this level and should involve the peripheral workers; this would be

useful in updating their knowledge and would help in problem-solving based on actual cases. This level has also a role to play in coordination with other areas in the health sector (e.g., environmental sanitation, control of communicable diseases, etc.) as well as with agencies and departments in other sectors. In order to have an effective system for dealing with the prevention of malnutrition, this level is vital as a link between the peripheral or first operational level and the third operational level of the health care system, and for its connexions with other sectors.

At the third operational level, which is often the hospital, severe malnutrition cases referred from the previous two levels are taken care of, in addition to the hospital's direct admissions. Overt cases with clinical signs of various forms of malnutrition are first treated here, then followed up as ambulatory cases (with periodic monitoring of weight gain) and, if required, supplied with food supplements. However, there is a need to orient hospital staff (including doctors and nurses) on the diagnosis of subclinical malnutrition, particularly the recognition of poor weight gain, low weight for age or weight for height, etc. These hidden or subclinical forms of malnutrition are often missed in hospital and the management procedures are also not clearly known or understood. To begin with, the growth charts should be made available in hospitals and staff should be trained in their use. All patients should be screened, including those who are admitted to hospital for other illnesses and complaints, because malnutrition is often an underlying factor.

The role of hospitals in preventive activities and measures, including community education, is important and needs emphasis. Hospitals have to be more community-oriented and more involved with community activities such as education; this would necessitate in-service training of hospital staff or perhaps an exchange of hospital and health centre staff in order that the problems of malnutrition as a community problem can be better understood. The opportunities for the education of patients in hospital are substantial, but are rarely utilized in this context.

The hospitals also have an important role in the secondary prevention of malnutrition by providing a surveillance and referral mechanism. A register of all patients admitted and treated should be maintained and, on discharge, should be passed on to the second or first operational level in order to ensure that they are followed up and continuing care is given. This could be more effectively done if the written records of cases are available. This surveillance would help the

health staff to map out the geographical areas where the problem exists and to identify the types of care for malnutrition and possible contributory factors to the problem, and would ease follow-up and referral. In order to achieve this, in most instances, referral systems would have to be improved or strengthened and better liaison and feedback should be established between hospitals, health centres and community health workers.

Summary

In summary, the following areas were considered to be of importance for primary and secondary prevention of malnutrition.

1. Screening and health-and-nutrition surveillance of mothers and children, including the use of growth charts and individual health records, in order to identify "at-risk" individuals and families.

2. Identification of the main determinant factors of malnutrition at community and family level.

3. Involvement of the formal educational system for the transmission of nutrition knowledge and the introduction of desirable nutritional practices early in life.

4. Adaptation of nutrition and health educational activities at the community level to local food habits and food availability, and active participation of the target group, mainly mothers and community leaders.

5. Family planning activities with a family welfare objective and emphasis on the maternal depletion syndrome and lactation failure as rationale for the acceptance of contraceptive measures.

6. Distribution of nutrient supplements as one of the important activities in secondary prevention, either in the form of food or nutrient supplements or food subsidies, the important fact being that these supplements should actually reach those who really need them most.

7. Improvement of nutrition education in hospitals and staff training in nutrition and in communication skills.

8. Provision of guidelines on the diagnosis and management of malnutrition cases at different operational levels by various categories of health staff; guidelines on the most practical referral system are also required.

9. Emphasis on primary or secondary prevention at different operational levels would depend on the structure of the health care system and categories of personnel available and their training.

Annex 3

CURATIVE AND REHABILITATIVE MEASURES: SOME GUIDELINES FOR THE CARE OF CHILDREN WITH PROTEIN-ENERGY MALNUTRITION

Principles of organization

In order to prevent recurrences of protein-energy malnutrition (PEM), the mother (or whoever is looking after the sick child) should be involved in the treatment and rehabilitation process. Even in advanced cases requiring emergency life-supporting measures, both the mother and the patient will benefit from the mother's involvement during treatment. Throughout rehabilitation, the education of the mother concerning appropriate child-feeding practices is essential. The educational message, as well as the nutrients used to complete the rehabilitation of the child—demonstrating the use of locally available products whenever possible—should be appropriate to the resources of the mother.

Children with severe PEM usually need treatment for intercurrent infections. Since malnutrition depresses the host's defence response, PEM victims with an infection may not react with fever, enlarged lymph nodes, and other signs. It has been shown that hospital treatment of children with PEM may result in cross-infections which not only interfere with the recovery process, but could have a fatal outcome. As these patients are very susceptible to cross-infection, they must be protected.

In the experience of many nutrition workers, *domiciliary* treatment of even advanced cases of PEM has been found to be possible and desirable if life-threatening complications are not present. In addition, community-level *nutrition education and rehabilitation centres* have been successful in a number of countries since they offer advantages over health centre or hospital treatment, in that they emphasize education of the mother rather than the use of medications in the rehabilitation process. The effectiveness of these centres will increase if the families of malnourished children are assisted in order to overcome the main causative factors present (unemployment, insanitary household conditions, etc.). The Caribbean Food and Nutrition Institute in 1972 reported lower case-fatality rates when PEM was treated in a domiciliary or community setting, because the dangers of cross-infection were minimized. Children who had been protected from exposure to infectious diseases, during the initial treatment and the

following weeks, suffered fewer setbacks and recurrences of PEM symptoms.

If treatment of relatively severe PEM is to be undertaken in the home, primary health care workers and paramedical personnel must be trained to recognize the children suffering from complications of PEM such as anaemia, intercurrent infections, symptoms of hypothermia, hypoglycaemia or electrolyte imbalance, and failure to improve in the first few days of treatment, as well as provide immediate help and refer them to a health unit. Home visitors—whether primary health care workers, voluntary collaborators among mothers, or similar categories—are needed to follow up children who have recovered from PEM; some of these children will be more "at risk" of a recurrence, often because of their socioeconomic situation. The mothers of these children need special support and should be identified early in the follow-up period.

Curative and rehabilitative measures

Curative measures may be divided into:

(1) those necessary for severe, immediately life-threatening cases of protein-energy malnutrition with oedema (kwashiorkor), in which the victim often suffers from intercurrent infections, anaemia, electrolyte imbalance, metabolic shock and other complications;

(2) those applicable to moderately affected cases;

(3) those necessary in early or mildly affected cases of protein-energy malnutrition.

The children in categories (2) and (3) should be treated in their countries according to the principles indicated under secondary prevention (see Annex 2). The severe cases in (1) require basic life-supporting measures, such as intravenous fluids, drugs to control infections, and intragastric feeding. Electrolyte and laboratory data, when available, are very helpful, though not essential, in case management. Although the treatment of severe cases is easier to carry out in well-equipped centres, it is now possible (through carefully developed protocols) to manage quite severe cases in district or regional centres. A review of these protocols based on worldwide experience is being published by WHO under the title *The Treatment and Management of Severe Protein-Energy Malnutrition.*[1]

[1] WORLD HEALTH ORGANIZATION. *The treatment and management of severe protein-energy malnutrition.* Geneva, 1981.

This book indicates how quite severe cases of PEM could be treated in health centres that are minimally equipped. It should help countries to draw up recommendations on manpower needs, training of personnel, and on equipment and supplies that are needed to improve treatment of severe or moderately severe PEM at intermediate levels.

The hospital staff should play an important educational role with the mothers of patients who require hospitalization. In many cases, nutritionists must convince their professional colleagues of the importance of including the mother in the rehabilitative process, moving the child out of the hospital ward to a nutrition rehabilitation centre, and teaching the mother about growth charts, as well as about the importance of psychological stimulation.

Community-level nutrition education and rehabilitation centres

At the community level, nutrition education and rehabilitation centres have been successfully used in the treatment of protein-energy malnutrition. Such centres should be considered as temporary facilities in situations where severe PEM is present and where the community has decided to participate in a programme to treat and eventually eliminate malnutrition by preventive measures. Experience shows these centres to be most successful:

—in the context of a nutrition monitoring programme, where every child in the community is weighed regularly through a primary health care programme (mothers may do this weighing on their own or in collaboration with health workers during periodic surveys);

—where locally available foods and equipment are used in the demonstration of appropriate food for children, including the preparation of weaning foods;

—where a follow-up programme can be carried out by home visitors (these may be voluntary collaborators), who will support the mother in continuing appropriate education and will follow up the child's rehabilitation.

In several countries, demonstration activities in food preparation—for training mothers in the appropriate use of locally available foods—have been shown to be effective. However, this approach implies an earlier and more general level of prevention. These activities, which could be carried out in demonstration kitchens or using the resources of a community household, should be complemented by appropriate local agricultural programmes.

Domiciliary versus hospital management

At the domiciliary level, worldwide experience has demonstrated that children with oedema due to PEM can recover when their mothers have been instructed in providing supplementary feeding in their own homes. To succeed, this approach requires a sufficient number of health workers to carry out regular home visits (one health worker for every 1000–2000 population in India; one voluntary collaborator for every 500 population in rural Haiti). A health worker or his collaborator must supervise the child's progress very closely during the rehabilitation period.

Hospitalization, on the other hand, is associated with a number of socioeconomic and medical problems—e.g., loss of income (many parents are daily-wage earners) since the mother and often both parents may have to accompany the severely malnourished child to hospital; costly transportation; antibiotic-resistant infections in the hospital; and the strange (if not hostile) environment of the city to the parents. One study showed that the health service had to spend 38 times more on the recuperation of a hospitalized child than if the case were managed at home. However, to ensure the survival of severe cases of malnutrition with shock, hypothermia or dehydration requires immediate intervention, which can be provided only in a hospital. Ideally, these cases should have been treated by primary health care workers at home in an earlier stage, thus preventing the serious complications. Studies have shown that domiciliary management of such cases, together with nutrition education, had a positive impact on the families and on the community.

The role of primary health care workers and family members

Primary health care workers can develop adequate skills and knowledge to manage malnourished children, provided that they are suitably trained and given support and supervision. Their training manuals should therefore include practical information on preventing and treating malnutrition. All children in an area served by a primary health worker should have personal health records containing growth charts (kept up to date by periodic weighing of the children). If the mothers are trained in these skills, they could collaborate with these health workers in both treatment and follow-up as well as in prevention. However, the supervisors of the primary health care workers,

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including doctors and paediatricians, should also be oriented in community diagnosis and management of malnutrition.

Experience in Thailand has shown that, in the absence of primary health care workers, local grandmothers, who usually treat malnutrition anyhow, can be recruited and trained in the prevention and treatment of malnutrition. Since these grandmothers are already accepted as treatment agents, and since they demand no payment for their services, they can provide an inexpensive and important infrastructure for nutrition work in the family. In Thailand, village health volunteers and village health communicators are also being trained in the early diagnosis and treatment of PEM.

Annex 4

ADMINISTRATIVE STRUCTURE OF NUTRITION SERVICES IN THE HEALTH SECTOR

A recent analysis of the role of nutrition units in a number of countries has revealed that most units were mainly concerned with the identification of nutrition problems and the development of technologies to solve them. Some emphasis was given to manpower development and planning, but this was mostly on an *ad hoc* basis and directly related to the development of specific technologies, without much regard to the fact that there were common objectives in the general development strategies of these nutrition units and other units within the health and other sectors. Hence, the tendency towards the setting up of vertical programmes, complete with specialized workers; this arrangement has been found to be expensive and ineffective because of the lack of multidisciplinary inputs.

More recently, the integration of nutrition activities into the general health services has helped to alleviate some of the problems relating to nutrition and complementary activities within the health sector; at the same time, however, other deficiencies inherent in the health service system were revealed. These included inadequate coverage of the population, poor utilization of the health services, the dichotomy of preventive and curative activities, and others. Consequently, the health sector started to take a critical look at the way it operated. This eventually led to the evolvement of a new philosophy, which culminated in the Declaration of Alma-Ata in 1978 concerning primary health care and the concept of health for all by the year 2000.

If health for all is taken as a national goal, it is necessary to define the long-range objectives, targets and strategies. The process could be outlined as comprising:

(1) A description of the expected state of health (including the nutritional status) of the population at the projected stage (about 20 years from now).

(2) The definition of objectives and targets.

(3) The formulation of the technical and support strategies.

(4) The establishment of necessary mechanisms to realize the above.

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The long-term (20 years) national objectives and strategies would serve as a guideline for the development of medium-term (5 years) plans. As an initial step, the goals, strategies, plans of action, and programmes of past national plans for development in the sectors involved should be studied to identify trends, successes and failures. On the basis of such studies, together with the identification and projection of factors that may influence health and nutrition development (e.g., energy costs), long-term objectives and targets could be defined. For the achievement of these objectives and targets, strategies should be developed in the main sectoral areas.

The strategies can be grouped into two categories (Fig. 1). First, strategies to identify problems and develop corrective measures. This category falls within the realm of technical ministries (such as health, agriculture, education, and social welfare) and was given a great deal of emphasis in the past. As a result there was, in the country's social and administrative milieu, little interest in these technical strategies and an inability to put them to good use. It was later realized that another type of strategy was needed. This (the second category) is one which cuts across disciplines and helps to ensure the common aims of all agencies. It includes the following: (*a*) intersectoral collaboration; (*b*) community involvement (the essence of primary health care); (*c*) financial resource management; (*d*) social resource utilization; (*e*) human resource development; (*f*) development of appropriate measures; (*g*) research; (*h*) development of planning, management and information systems; and (*i*) policy development (these nine items are denoted by a, b, c, etc. in Fig. 1).

Both categories of strategies can be realized by the development of programmes that include activities relevant to each area. The various organizations are then given the responsibility of executing these programmes. It therefore follows that the organizational structure, of which the nutrition unit is a part, should be reoriented so that this unit could suitably serve the purpose and functions of the organization.

Formerly, nutrition units played their part largely in the realization of the first category's strategies. With the advent of the primary health care principles, all units must reorient themselves to give guidance and support to the programmes and activities executed by the people. Nutrition units are no exception; they have to reorient themselves and become part of a common front with the other units in the health and other sectors. They must contribute to the development of the strategies in the second category, which were described

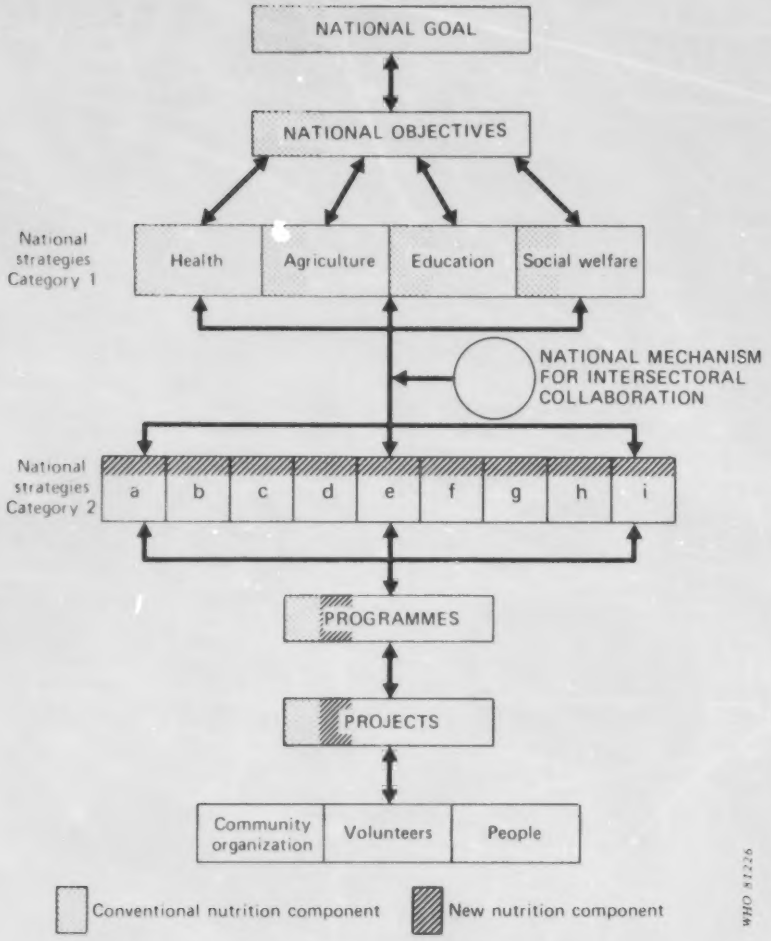

Fig. 1. Nutrition as part of the overall health development strategy.

above (see also Fig. 1). Among these strategies, one that is of particular importance in regard to nutrition is intersectoral collaboration. This strategy calls for the development of a collaborative mechanism as a key to the formulation and implementation of all other strategies.

The development of such a mechanism may require the following undertakings:

(1) The creation of a task force, whose members will be prime movers within the agencies involved. This task force, because of its multidisciplinary nature, should work for and under the direction of the agency which is responsible for overall social development, such as the national planning body. It should study the mechanisms and organizations involved in planning and development (as practised by the various ministries) and then recommend the establishment of a feasible network among them. This network will be a mechanism to enhance development capability among the agencies and to ensure coordinated action in implementing the programmes.

(2) The focal point of this health development network could be located in the ministry of health or in one of the agencies or a university, as the situation may dictate. Such a focal point could be a separate small office or a part of the planning division. It should be staffed by a reasonable number of technical and support personnel, drawn from the various technical and implementing units in the ministry and from outside by special arrangement. The competent technical staff of the nutrition unit could also be made available to the focal point, which will be responsible for sectoral planning, monitoring, and support of the progress in programme implementation in the health sector.

(3) After the recommendations of the task force materialize and a larger network for development is set up, the health development network will become a part of the overall social development network with a focal point within the national planning body (in one of the divisions whose functions are relevant to social development). If necessary, the functions of this division could be modified to suit the new role. This is considered important because many of the second category's strategies (such as policy development, financial system modification and management, normalization of planning and management processes among ministries) will have to be carried out not only through the health and health-related agencies, but through the whole administrative machinery of the country. Hence, they are best initiated at the highest level. Moreover, the general social development focal point at the national planning body will assist in the development of national objectives, strategies, and plans of action, and especially in devising and implementing a strategy to reallocate the national budget so that the various agencies will be able to serve the national objectives better. All these must be done as part of the long-

term planning process, which is the direct responsibility of the national planning body.

(4) The creation of a national coordinating body (or adaptation of an existing one)—comprising high-level policy-makers, technologists, and possibly members of the public—to oversee development according to the national objectives and strategies.

Within this overall framework of intersectoral collaboration, the nutrition unit will work for the realization of nutritional objectives and strategies which, by their nature, cut across the functions of various agencies. The change in the role of the nutrition unit can be summarized as follows: to provide guidance in nutrition development to the various implementing agencies through the health development network, or through the overall social development network, which is considered an even more effective approach. It follows that the nutrition unit should initiate the development of the second category's strategies within its own programmes, in close collaboration with units in the other sectors involved in the network. In this way, progress in nutrition development (in the context of primary health care) can be achieved.

Annex 5

PROVISION OF ADEQUATE MANPOWER

The provision of adequate manpower is essential if the programmes for nutritional improvement are to be effective. It is also equally important that knowledge about food and nutrition problems and their possible solutions should reach the two extremes of the integrated system, i.e. the most senior government decision-makers and the needy population.

Roles and levels of responsibility of nutrition manpower

The human resources required for nutrition programmes were grouped broadly into the following functional classes by a Joint FAO/WHO Expert Committee on Nutrition:[1]

(*a*) those concerned with planning policies at national and sectoral levels;

(*b*) those concerned with the planning, implementation and administration (including surveillance and evaluation) of food and nutrition programmes and with interagency coordination at national and other levels—including personnel in ministries of agriculture, health, and education and in nutrition institutes, i.e., all those involved in programmes relating to food production, distribution, consumption, and biological utilization;

(*c*) those concerned with the delivery of food and nutrition services, e.g., agricultural extension workers, other rural extension workers, teachers, health workers;

(*d*) those concerned with coordination of these services at local level—including local government administrators and field staff of technical agencies (concerned with health, agriculture, education, etc.);

(*e*) key personnel in each community (political, social, and religious leaders, etc.);

(*f*) local auxiliary workers, including primary health care workers.

Such manpower could be working as part of a health-sector team or a non-health-sector team, or in a multisectoral team dealing with

[1] WHO Technical Report Series No. 584, 1976 (*Food and nutrition strategies in nutrition development*: ninth report of the Joint FAO/WHO Expert Committee on Nutrition), p. 55.

the coordination of planning and implementation of multisectoral food and nutrition programmes. In all countries, senior people with a knowledge of nutrition are needed in various government sectors and other institutions—including the ministries of health, agriculture, economics, planning, social welfare, and education, the universities, and medical schools.

Human nutrition is a challenging discipline that cuts across many traditional divisions of subject matter and requires special skills. It is therefore important that people (who may be expected to occupy senior positions in any of the fields to be outlined below) should be exposed, during their training, to the different elements that make up the range of human nutrition. It is advisable that, as far as possible, students from different disciplines should be trained together in these fields. Most of them will probably work in a particular sector according to their previous background; however, the above training will improve their capacity for coordination and cooperation between different sectors.

A WHO Consultative Group of Directors of Training Programmes in Public Health Nutrition in 1976[1] outlined as follows the tasks, for which senior nutrition workers should be prepared, although no one could be expected to work directly in all these fields:

(*a*) *Assessment of the nutritional situation in a country, region or state.* This involves finding out how many and what categories of people are malnourished, to what degree, in what way, and where (a functional classification).

(*b*) *Identification of the factors responsible for the overall state of nutrition and for any variations found.* The nutritional status of both individuals and communities, while influenced by the intake of energy and nutrients, is affected by a wide range of environmental and socio-economic factors, such as food availability, water supply, sanitation, education, income and food prices, and health care. The assessment of the situation and the identification of responsible factors should be expressed in terms that would help in the preparation of corrective actions.

(*c*) *Cooperation and interaction with other sectors.* The training must enable the graduates to work closely and continuously with colleagues from other disciplines. They should be prepared to foster and maintain such cooperation. They should be active in building up

[1] Report of a Consultation of Directors of Nutrition Training Programmes, Geneva, 22–26 November 1976 (unpublished WHO document NUT/77.1).

a nutrition team, with members from several sectors (e.g., economic planning, community development, agriculture, health education, etc.).

(*d*) *Stimulation and participation in the development of policy.* The organizations of the United Nations system are now putting considerable emphasis on the need for developing central bodies for food and nutrition policy. People trained in nutrition along the lines outlined herein are essential for this key development. They will play a significant part in the selection of appropriate strategies and in the promotion of the concepts that underlie such strategies. They will ensure that the need for development programmes to take account of nutrition is recognized at high level.

(*e*) *Planning, supervision and evaluation of nutrition programmes.* The responsibility for the management of programmes that result from decisions on policy and strategy will rest with particular government agencies, e.g., a school feeding programme will usually be the responsibility of the ministry of education. However, the person who advises on the planning, organization, supervision and evaluation of such programmes should be well trained in nutrition and should understand their relationships with relevant programmes in other fields.

(*f*) *Development of local training programmes.* The execution of nutrition programmes at the community or district level requires the training and retraining of a wide variety of personnel at various levels, such as village headmen, primary health care workers, public health nurses, agricultural extensionists, teachers, and administrators. The organizers of such programmes should have a multidisciplinary background and a high standing in the community and the government.

(*g*) *Promotion of teaching of nutrition at university and medical schools.* In addition to the training of specific nutrition workers (e.g., nutritionists and dietitians), there is a great need for introducing and improving the teaching of nutrition to others in the fields of health, agriculture, education and the social sciences. People well trained in nutrition are needed to develop and contribute to these courses.

(*h*) *Research.* Most of the above activities should include a research component. Additionally there is a need for people who will pursue a career in research in nutrition. In order to make effective contributions, such people must have a broad background in nutrition which emphasizes the intellectual challenge in this field.

Appropriate training of personnel (both specialized and general, in the health and non-health sectors) is an essential prerequisite to the provision of adequate manpower. A national-level plan for the

development of manpower in respect of nutrition activities is therefore needed. Health sector manpower can be classified as specialist personnel (usually functioning at central and regional levels) and general health personnel (functioning at all levels of the health service, from central policy-making and planning to the delivery of primary health care at the periphery). In keeping with the high priority assigned to primary health care, such a plan should be structured to provide—at all levels and in the relevant sectors—manpower resources to promote and support the development of primary health care at the community level.

Specialized senior personnel in nutrition are required principally at the central, regional and area levels. They will be located in universities, national nutrition units and institutions, and in regional and area teams in the health and other relevant sectors. Specialized personnel can be considered under three major headings: academic and research, policy and planning, and programme implementation. Those in the academic and research category are usually located in university departments, nutrition institutes and similar non-service institutions, and comprise clinicians, public health physicians, biochemists and nutrition scientists. Their role is to provide undergraduate and graduate-level training for the health, nutrition and related professions and to conduct research into identified health and nutrition problems. They are also an important source of expertise and independent opinion to food and nutrition planners and to policy-makers in various sectors.

At the central level of health services, specialized personnel are required to work in the nutrition unit of the ministry of health. These units are usually staffed with public health physicians (who have specialized in nutrition) and public health nutritionist/dietitians; their area of responsibility covers service research, the establishment of norms and standards, in-service training, and consultations to advise other units and sectors on matters relating to the application of nutrition science to public health.

At the regional, area or district level, depending on resources, specialized public health nutritionists or nutritionist/dietitians will form part of the health service team. They will provide expertise for the planning, implementation and evaluation of the nutritional aspects of integrated programmes. They will also be responsible for the pre-service and in-service training of general health personnel (both professional and auxiliary) within the programme area, and for their supervision in the service setting. It is not generally envisaged that

professional specialized nutrition personnel will operate at the local level, with the exception of pilot or special projects, although nutritionist/dietitians will be involved in the supervision and in-service training of nonspecialized community-level personnel.

Nonspecialized personnel in the health sector provide the framework for implementing nutrition activities at every level. At the central level, planners and policy-makers will be contributing to nutritional efforts and a nutrition component should be included in their training. Health service directors and service professionals at each level and in each service category (i.e., physicians, nurses, sanitary engineers, educators) must also be seen as manpower contributing to

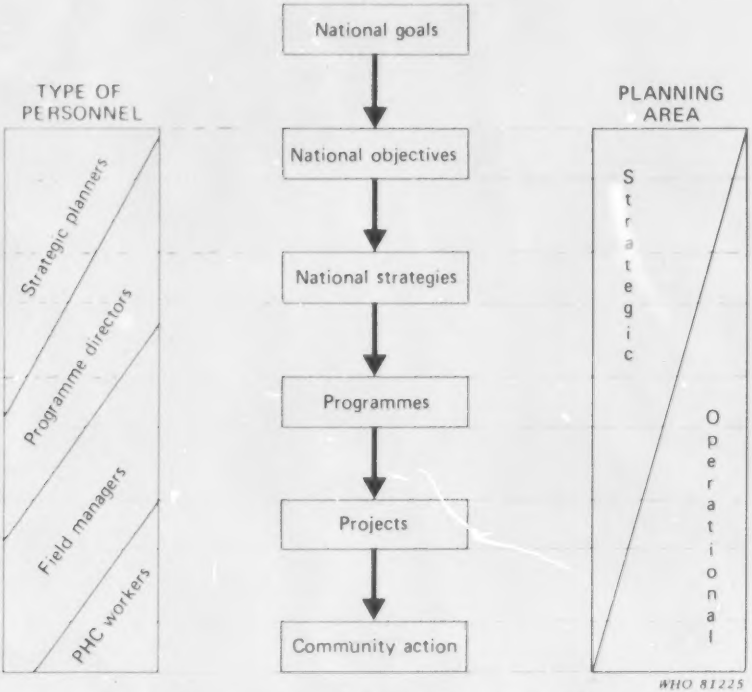

Fig. 2. Types of personnel required and their roles at different operational levels. The relative proportions of personnel and of planning (strategic/operational) involved are roughly indicated by the areas covered by horizontal extensions from each of the boxes in the central column.

nutrition and therefore requiring appropriate training, guidance and support.

At the local level, auxiliary and primary health care workers are the ultimate implementers of nutrition policy, plans and programmes, the primary health care approach providing a unique opportunity to establish nutrition activities in the framework of basic health care for the entire population (see Annex 6 for details on the training of these workers).

The types of personnel required and their role at different operational levels are set out in Fig. 2. This diagram, though schematic and approximate, provides a useful guide to the different types of non-specialized health personnel that are involved at each level of operation. The characteristics of the planning process (illustrated by the right block of this diagram) is strategic at the higher level; it involves essentially making a choice between various available measures to reduce or solve the problem. At the lower level, once the strategies have been selected, planning will focus on the design of operations in order to overcome the expected constraints and reach the objectives and targets. The various types of personnel required at different levels of planning and implementation (middle boxes in Fig. 2) are indicated in the left block of the diagram. The amount of emphasis given to the training of these different personnel will depend on the situation of a given country.

In addition to health service manpower, similar and parallel manpower resources should be developed in the other sectors such as agriculture, education and social welfare. At each level, specialized and general service personnel from these sectors should be available to work with their counterparts in the health sector in implementing the multisectoral programmes. It is obvious that appropriate multidisciplinary training would greatly increase the quality of manpower and permit effective coordination of activities in the service unit.

Training of nutrition manpower

Specialized manpower

In the *health sector,* most specialists in nutrition would have followed well organized academic courses for professional training at the universities. Biochemists and physicians (specialized in public health or clinical nutrition), as well as nutritionist/dietitians, would also have followed specially designed courses during their professional

education, both at undergraduate and graduate levels. However, food and nutrition planners and nutrition education specialists would not have had such training.

The need for a special category of food and nutrition planners, as part of the health sector team or in a multisectoral planning team, was clearly seen in the early 1970s when international organizations and governments realized the importance of establishing and implementing multisectoral national food and nutrition plans and programmes. As a result, specialized training courses and programmes have been developed in some universities and training centres in different regions of the world. UNICEF, FAO, and WHO (and PAHO) have promoted and sponsored technical group meetings, seminars and training courses directed to the establishment and/or reinforcement of training centres and to increase the number of specialized personnel in the area of nutrition planning. They have also rendered advisory services to governments for the implementation of multisectoral national plans in food and nutrition. Specialized training in nutrition education also evolved from the need to introduce more technical aspects and new methodologies in educational activities in the areas of food and nutrition at community level (non-formal education and through mass media); this training is provided at university level.

The training of nutritionist/dietitians has been adapted to the various types and levels of their responsibilities. These workers usually form part of a multidisciplinary team for programmes in the private and public sector—covering the fields of health, education, agriculture, the food industry, marketing, the economy, and administration. Within each sector, the responsibilities of the nutritionist/dietitian depend on the character of the programme. They fall within the following areas:

(*a*) Diet planning and dietetic care to healthy individuals and groups, as well as to sick people.

(*b*) Administration of nutrition and dietetic programmes (planning, organization, direction, supervision and evaluation).

(*c*) Training and education at university undergraduate and graduate levels in schools of nutrition and dietetics, as well as in schools of medicine, nursing, veterinary medicine and other schools. Teaching and in-service training of professional and auxiliary personnel.

(*d*) Nutrition research in hospital settings, applied nutrition, and education projects.

(*e*) Advisory services in nutrition and dietetics.

Training schools for nutritionist/dietitians at first used to focus on dietetics and mainly on institutional food services; however, in the last two decades the training has included applied and public health nutrition which gives these health workers a wide range of possibilities of direct participation in the planning, supervision and evaluation of food and nutrition activities at the community level.

In the *non-health sector,* certain types of manpower could play an important role in a coordinated food and nutrition national programme, e.g., food engineers and food technologists, as well as agronomists, who are involved in a wide range of activities related to the production, processing, and conservation of foods and to the development of new food mixtures of high nutritional value and low cost. All these aspects could improve the effectiveness of nutrition interventions at the community level. These types of manpower also receive their training in universities at both undergraduate and graduate levels.

"Nonspecialized" manpower[1]

Very high priority should be given to the nutrition training of "nonspecialized" manpower in the *health sector;* this manpower includes public health physicians, clinicians (particularly paediatricians), nurses, social workers in health teams, sanitary engineers and inspectors, auxiliary nurses, and primary health care workers who are responsible for delivering health care to the community at the local level. All of them should have a clear understanding of the magnitude and characteristics of the existing food and nutrition problems in their country, as well as the main causative factors and their unfavourable impact on both the health sector and other developmental sectors. They should also have sufficient knowledge about the diagnosis, prevention and treatment of prevalent nutritional diseases. This knowledge and understanding will, not doubt, increase their motivation, interest and effectiveness in the implementation of nutrition components as an integral part of the health services rendered to the community.

Although some training models have been developed in some regions for the incorporation of nutrition components into medical

[1] In the present context, this term refers to personnel who are not specialists in nutrition but may have specialized in other fields, and whose work is relevant to food and nutrition activities.

and nursing education, only limited success has been obtained. However, WHO has continued to assist Member Governments in their efforts to reinforce nutrition education into basic programmes for undergraduate training of medical and nursing students. The main obstacle has been the scarcity of university teachers who have been trained in nutrition and have experience not only in public health and clinical medicine, but also in basic and applied research.

Nursing schools usually include nutrition and dietetics in their curriculum for undergraduate training, but frequently it is a theoretical type of teaching without a good information input or a satisfactory approach towards the solution of the existing nutrition problems in the community the students will serve. The same difficulty is to be found in the basic education given to auxiliary nurses and primary health care workers.

Besides the health sector, *other sectors of social and economic development* have an important role to play in the planning and implementation of a food and nutrition policy and attendant programmes. All of them include professionals who should receive adequate information and training on nutrition problems, their causes and consequences, as well as the rationale for food and nutrition interventions. This should be taught at the universities during their professional education or, when appropriate, through *ad hoc* in-service courses, seminars or workshops. Thus, they will understand the high priority to be given to nutrition programmes and projects within a national development plan and will act accordingly.

At the community level, there is a wide range of non-health workers who could play an important role in nutrition activities and programmes; they include primary and secondary school teachers, home economists, agricultural economists, social and community development promoters, and political, social and religious leaders. These people are in close and permanent contact with the community and could well serve as "multipliers" of nutrition messages and interventions to community groups. There is thus a great need to introduce a nutrition component into their basic formation, as well as to give them adequate in-service training in the practical aspects of food and nutrition, if their support to the primary health care workers' activities in this area is to be ensured.

Annex 6

NUTRITION TRAINING OF PRIMARY HEALTH CARE WORKERS

Primary health care workers are basically community health workers at the level of first contact of the community with the health care system. This level of worker in different countries has been called by various names and may be characterized by differences in education, type of training, as well as conditions of work. In most instances, they are multipurpose workers who are engaged in a variety of health activities (promotional, preventive, curative, and rehabilitative) for individuals, families and the community. The training of the different categories of primary health care worker must therefore be adapted to the educational level and take into account the job descriptions and expected roles and responsibilities of these health workers.

It must be emphasized that the implementation of diagnostic, preventive and therapeutic activities in nutrition should be within the context of the overall health programme. Since primary health care workers function within the community setting and because corrective and preventive measures of malnutrition and nutrition promotion ramify into many sectors and agencies in the community, it is important that their training should be related to other sectors and disciplines such as agriculture, home economics, education, community organization, etc.

Who is to be trained?

Primary health care workers are best selected by the community in which they live and where they are expected to work. They may be part-time or full-time community health workers and may or may not be able to read or write. In some cases they may be an auxiliary health worker or paramedical personnel such as a midwife or community nurse who is provided with some support by the community. As they will hold key positions in the community, they must be acceptable to the community, be willing to identify themselves as part of the community, be able to relate to mothers and children as well as other community members, and be able to mobilize the community and its available resources and interact with other agencies. They must be willing to learn and should be mature enough to exercise authority and take initiatives in keeping with their role and responsi-

bility. The success or failure of nutrition intervention activities at the grass-root level will depend on these personnel as well as the training and support given to them.

In what are they to be trained?

The training of these workers will vary in each situation, but should take into account the local problems, needs, priorities and available resources, as well as the community's organizational set-up and system of functioning. Training should include learning how to identify and mobilize community support, how to work with people and personnel of other agencies, how to identify nutritional problems and "at-risk" groups, and what appropriate action to take and how. The WHO guidelines on the training of community health workers in nutrition[1] deal with the expected tasks, learning objectives, and the desired knowledge and required skills for each activity. The training guidelines also include the following: getting to know the community and its needs; measuring and monitoring the growth and nutrition of children; breast-feeding; diets for young children; nutrition of the mother; identification, management and prevention of common nutritional deficiencies; diarrhoea and nutrition; nutrition and infection; and motivating and planning for action at the local level.

Who is to train them?

In order to ensure an effective and continuous programme for training of these primary health care workers, a core group of trainers should be specially trained. This training of trainers is important and forms the basis of the training of primary health care workers. The trainers should be instructed in teaching methods and communication skills, in addition to the technical aspects of nutrition. Ideally the trainers should be in close contact with these health workers and should have first-hand experience of the tasks that they are going to teach; they may also function as their supervisors though this may not be feasible in all cases. Trainers should also be given the responsibility to develop the curriculum, methodology and contents of the training programmes. The training-of-trainers programmes should be based on an intersectoral approach in order to expose the trainers to nutrition problems within the broad overall context.

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[1] *Guidelines for training community health workers in nutrition.* Geneva, World Health Organization, 1981 (Offset Publication No. 59).

Where are they to be trained?

The training of primary health care workers should be community-based and should be carried out as close as possible to the place or environment in which they will be expected to work. Thus, these workers will be exposed to typical local problems and solutions and will be able to understand the community structure and its mechanisms of functioning. There may be problems in certain countries where local training areas and facilities have still to be developed. The available community resources (e.g., schools, community halls) can be used as training areas.

How are they to be trained?

As mentioned earlier, these health workers are expected to perform a wide range of tasks and activities and, in practice, this often leads to overloading them and the basic health care system, particularly with regard to maternal and child health care. It is imperative therefore that a task analysis should be made of these workers' activities and only the minimum essential ones should be taught. The tasks and activities that are both directly and indirectly related to nutrition should be identified; and the training should be practical and oriented towards local problems, priorities and needs, and based on interventions that are feasible at the operational level. Theoretical discussions should be reduced to a minimum and the training should be conducted, as far as possible, in the community and away from the classroom. Emphasis should be given, during training, to simple tasks, e.g., weighing the child, recording the weight on the growth chart, and interpreting and explaining to mothers the significance of the weight curves. The significance of each action has to be understood by these health workers so that their tasks become more meaningful and they are able to understand "why" they must perform them.

Nutrition should not be taught as a "vertical" subject, but should be related to and integrated with other areas of health and other disciplines. It is important to emphasize the significance of nutrition to child-spacing, diarrhoeal diseases, environmental sanitation and water supply, food and agriculture, home economics and family budgeting, food taboos, preferences and beliefs, etc. Training methodology is an important factor to be considered in the training of primary health care workers and it should be based less on conventional methods of teaching and more on discussions, dialogue sessions, demonstrations, role-playing, problem-solving, and earliest possible

exposure to the community and its problems. As far as possible, the tasks of these health workers in nutrition should be clearly defined and a simple manual or guidelines for nutrition-related activities should be developed for training and service needs. The development and production of audiovisual aids as a support to training are also important.

It is essential to impress upon these workers that a large part of nutrition promotion stems from and has to be carried out within the family environment—physical, social and cultural. Their role in educating and helping the family in self-care and self-reliance cannot therefore be overemphasized during their training period.

The training of primary health care workers in nutrition would not be complete if it did not include the following supportive measures which are necessary for the programme's effectiveness and efficiency:

(*a*) Technical support and updating of knowledge by means of refresher courses and other in-service courses, case-study discussions, and meetings which involve these workers as a part of the health care team.

(*b*) Supervision in order to provide continuing education, including problem-solving, and on-the-spot training but not to find faults. Supervisors should understand and know the functions and responsibilities of the primary health care worker and be able to guide and provide appropriate technical support as and when required. The situation of having too many supervisors for these workers is not desirable and should be avoided.

(*c*) Logistic support, i.e., provision of equipment and supplies that are required for the full functioning of these health workers.

(*d*) Establishment of, or improvement and strengthening of, the referral system and chain so that the primary health care worker can work in confidence and establish close contact with the rest of the health care system.

(*e*) Lastly, but the most important, are the human aspects and considerations since these workers are often in isolated and remote areas and should not be forgotten. Proper recognition of the services of the primary health care worker, a system of rotation wherever necessary, and frequent visits or communication by supervisors are important. Consideration should also be given to opportunities for career development of these workers and some form of compensation (against loss of working time) might be provided to volunteer primary health care workers.

Annex 7

RECENT ADVANCES IN NUTRITION KNOWLEDGE AND METHODOLOGY: THEIR APPLICABILITY TO THE HEALTH SECTOR

Advances in knowledge in nutrition during the last few years offer great potential for operational implementation. The application of these findings to the public health field may have consequences that need to be carefully evaluated. No time must be lost in doing so.

Some of the new knowledge is briefly reviewed below.

1. *Nutritional modulation of the immune response*

It has been known for some time that malnutrition is linked with increased susceptibility to infection. Viral and Gram-negative bacterial infections are common causes of morbidity and mortality in protein-energy malnutrition (PEM). Clinical studies on the influence of malnutrition on defence mechanisms are extremely complex owing to the difficulty of assessing exactly the degree of malnutrition, its nature, and the associated conditions such as infectious factors.

Mechanisms of defence are affected in different ways. Serum IgG, IgM and IgA levels and immunoglobulin synthesis are usually normal or increased; the antibody response to injected antigens is usually normal but may be deficient in severe forms of PEM. Secretory IgA levels in the gastrointestinal and respiratory fluids are generally decreased. There is enough evidence, however, to suggest that B-cell immunity is better preserved in protein-energy malnutrition than T-cell immunity, as judged by the following criteria: depression of cutaneous delayed hypersensitivity, skin response impairment, even in mild to moderate malnutrition; decrease in the number of circulating thymus-dependent T-lymphocytes and decreased response to thymus-dependent antigens. Cell-mediated immunity returns rapidly to normal during recovery from PEM after the provision of adequate amounts of nutrients. Specific deficiencies of zinc, pyridoxine and vitamin A also affect the cell-mediated immunity in laboratory animals and in man.

2. *Fetal malnutrition and immune response*

If malnutrition occurs in the mother during the early stages of immunological development of the fetus, the cell-mediated immunity

of the latter will be affected; the depression will be important and long-standing. These alterations may have important implications—for instance, a high frequency of pneumonia and other infections in "small-for-date" babies.

3. *Immunocompetence as an index of nutritional status*

There are some indications that changes occur in cell-mediated immunity and the complement system before any other alterations in the physical appearance or the biochemistry of children who are affected with protein-energy malnutrition. This may be a significant development in the assessment of the nutritional status of communities or in epidemiological studies of PEM.

4. *Composition of breast milk*

It is well recognized today that breast milk contains the nutrients that are indispensable during the first months of life; however, it contains in addition a number of other elements such as lymphocytes, antibodies, macrophages and phagocytic granulocytes which contribute to the defence mechanisms of the newborn. Breast milk cannot therefore be considered solely as a food; it is also a biological product, destined to increase the resistance of the newborn to infections. Studies are being carried out on the significance of other constituents of breast milk such as lactoferrin, lysozyme and lactoperoxidase and on its possible anti-allergic properties.

5. *Diarrhoeal diseases*

Glucose and to a lesser extent saccharose facilitate water and electrolyte transport through the intestinal wall, and advances in the technology of oral rehydration have cut down mortality in diarrhoeal diseases. Programmes of early oral rehydration, coupled with dietary supplementation, should therefore be effective in preventing the development of malnutrition as a result of diarrhoea.

6. *Intrauterine malnutrition*

Maternal nutrition is known to influence intrauterine growth but the extent to which it does so is unknown. Many other factors also exercise an influence and may be more important. Further studies

should be carried out to determine the influence of the dietary intake and the contribution that dietary supplementation can make towards the restoration of an adequate birth weight. It is not possible so far to draw any definite conclusions from the existing data.

7. *Weaning process*

The weaning period, when the child is progressively weaned from the breast and receives increasing amounts of foods other than breast milk, is critical from many points of view. The number of infectious episodes increases significantly; the growth rate may slow down; and malnutrition may appear. The need to feed the young child adequately is obvious and this can be done only by proper education of the mother. There are a number of studies that are being carried out at the present time to find out the best approaches to the education of the mother and to the identification of the best uses that can be made of available local foods.

8. *Mental development and nutrition*

The interrelationship between nutrition and mental development is complex, and the role played by psychosocial and emotional stimuli at home is considerable. Field studies currently being carried out, on the delivery of specific health, nutrition and informal education services, have shown promising results in the emotional and physical development of preschool-age children.

9. *Food fortification*

Programmes of fortification of salt with iodine and of milk and margarine with vitamins A and D have been implemented for many years in many countries and have proved to be extremely effective in preventing specific deficiency diseases; more recently the feasibility and effectiveness of fortifying sugar with vitamin A for the control of vitamin A deficiencies has been demonstrated in some countries. Research is being carried out on the practicability of fortifying other food components such as monosodium glutamate with vitamin A. There is also recent evidence that fortification of salt, sugar or fish sauce with iron can show beneficial results. These new findings could lead to the development of national programmes of food fortification in the near future.

10. *Appropriate field technology*

Simplified methods for the assessment and monitoring of the nutritional status of individuals and of communities have been developed in recent years. They will allow a better understanding of the interrelations of malnutrition with health, social, economic and cultural factors; a more objective evaluation of programmes; and, in many situations, through the screening of children and mothers at risk, a more effective looking-after of their health and nutritional needs.

11. *Protein-energy requirements*

A number of studies are being conducted on the question of energy and protein requirements. Among these, special mention can be made of the apparently different patterns of energy utilization, the influence of different levels of energy intake on protein utilization, the influence of stress and infectious factors on the energy and protein requirements, and the regulation of appetite and how it is affected by disease. Information on these various issues is essential for a correct planning of the populations' diets and for the correction of malnutrition which exists in so many developing countries.

12. *Alternative approaches to service delivery*

The primary health care concept (with its components of self-care, community involvement, and simplified technology) opens new avenues for the delivery of nutrition services, including nutrition education, at the peripheral level. Research on alternative approaches is at present under way. Methods and criteria for the identification of children and mothers, families, and communities at greatest risk are of special importance in this regard.

Annex 8

NUTRITION RESEARCH TO SUPPORT HEALTH MEASURES

Three types of nutrition research are considered relevant to support health measures:

Research on the health significance of nutritional status indicators

Although anthropometric measurements and, to some extent, biochemical tests are often used for assessing nutritional status, the interpretation of such data still poses a problem. With regard to two of the anthropometric indicators most used in children, i.e., weight-for-height and height-for-age, an association of low values with increased morbidity and mortality has been found, but the causal nexus and the quantitative indications of risk are far from clear. A similar situation exists with regard to the interpretation of biochemical data, since the existing definitions of deficiency states have not been tested against functional performance in most instances. It is suggested, therefore, that more research is needed in order to find out at what level the changes of anthropometric and biochemical measurements affect health status in terms of morbidity and mortality and in terms of functional alterations in physical working capacity, immunobiological competence, mental behaviour, and reproductive performance.

This research would enable the health sector (*a*) to define more clearly the health risks posed by malnutrition, and (*b*) to set up more meaningful criteria for action with regard to health and nutrition.

Research on measures for the control of malnutrition

There is a growing body of evidence indicating that specific nutritional deficiencies are not always the result of primary dietary deficiency but may be due to impaired absorption or utilization of specific nutrients. The case of goitre due to the presence of goitrogens in the diet is one example. Another example is iron-deficiency anaemia resulting from the relatively low absorption of iron owing to the absence of animal proteins or of ascorbic acid, or possibly from poor utilization owing to

vitamin A deficiency. Similarly, vitamin A deficiency may result from a poor absorption of carotenes owing to the low content of fat in the diet. The implications are that the control of specific deficiencies could sometimes be achieved without resorting to supplementation or fortification measures but by slight modifications of the existing dietary pattern.

It is also well known that a number of infections may precipitate the development of severe forms of protein-energy malnutrition (PEM); among these, diarrhoeal diseases play a major role. The impact of early rehydration and of appropriate dietary management of children with diarrhoea on their nutritional status needs further study.

Health services research

Research into the feasibility and effectiveness of nutrition intervention measures at the community level is much needed and should be given a high priority. Although, in principle, there is enough technical knowledge available on which community intervention programmes could be based, evidence is still lacking concerning the effectiveness of such measures, particularly in view of the inevitable constraints of manpower, financial resources, and supporting infrastructure for delivering services.

Within this framework, the following areas are of high priority:

(1) The control of specific deficiency diseases. One of the major problems is to reach the groups at greatest risk, especially in the case of iron-deficiency anaemia and of vitamin A deficiency. Food fortification is not always possible or desirable and, in many instances, supplementation through nutrient distribution is the only possible solution in the short range; development of alternative strategies for reaching vulnerable groups is therefore necessary.

(2) The practical application, in specific national or local settings, of various health care strategies for the treatment at home, or at the primary level of health care, of children ill with PEM.

(3) The effectiveness of the nutrition component in prenatal and infant care, with particular emphasis on weaning practices, including the role of industrially-processed (locally or nationally) versus home-prepared weaning foods.

(4) Strategies for improving the distribution of foods within the family, ensuring that young children receive their share of what is

available at the family level. Special attention should also be given to the adequacy of their diet in terms of composition and preparation in view of their special needs

(5) The effectiveness of nutrition education, carried out by the community extension workers, taking into consideration the economic, cultural and other characteristics of the community.

(6) The identification of the nutritional impact of non-nutritional problems such as infections, birth-spacing, and ecological changes in developing societies.

(7) The extent of population coverage. In many instances, the existing health services effectively cover only a part of the population they are supposed to take care of. It is therefore important to initiate controlled studies on the possibility of using, under the supervision of health personnel, local people as paid or unpaid volunteers for the delivery of community nutrition programmes.

(8) The feasibility and effectiveness of feeding schemes (day-care centres, school feeding), food production programmes, and nutrition education activities developed in cooperation with other local services such as those concerned with education and agriculture.

(9) The participation of the community in nutrition programmes. Nutrition programmes will be successful only if accepted and supported actively by the community and for that reason the community should be involved in the identification of their problems and the planning of remedial activities at a very early stage. More information needs to be generated on how the community can be brought into early planning, what its role and responsibilities are in carrying out the programmes, and which elements of the local infrastructure can be best used for this purpose.

(10) The behaviour and attitudes of primary health care personnel regarding the integration of nutrition activities in their regular activities. Attitudes of health policy-makers, responsible for planning and implementation of primary health care and its nutrition component, should also be investigated.

(11) The selection of indicators for programme evaluation. As the improvement of nutrition and health status is considered the ultimate goal of nutrition intervention programmes, the evaluation of these programmes has usually been made on the basis of nutrition status indicators such as weight-for-height and height-for-age, as well as on the changes in morbidity and mortality. These measurements have been useful in assessing the effects of intensive nutrition intervention programmes in seriously affected areas. However, the integration of

a nutrition component in the primary health care system may not produce measurable changes in the usual indicators in a short period of time, particularly in regard to the growth of children. The possibility of using other indicators, particularly of a functional nature, such as physical activity, learning capability, and psychosocial behaviour, needs to be investigated.

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